

SURVEYOR MANUAL KOBO TOOLBOX

Field Data Collection & Revue Tool

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Suva, Fiji, 2023

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PART I

FIELD DATA COLLECTION

A. 1.0 Introduction

B. 3.0 Accessing Kobo Toolbox Application

C. 4.0 Data Collection

A 1.0 Introduction

Disasters in the Pacific have a far-reaching effect that reverses development gains. Understanding disaster risk is critical for Pacific Island Countries to determine the best options and actions to prevent and reduce new and emerging risks. The SPC PCRAFI Project is contributing to this by working together with Pacific Island Countries and key technical partners to collect and assemble an exposure database comprising of population, buildings, infrastructure, and strengthen the capacity of key agencies to use and apply the disaster risk modelling products in policy and investment decisions.

Turning real world/reality into a format/data source through data collection is key. The field data collection surveyor manual uses KoBoToolbox to bring this together. KoBoToolbox is a suite of tools for field data collection which is free and open source. Key features of Kobo Toolbox include being:

- A Form builder (design forms with ease)
- Able to collect data (online & offline)
- Able to Analyse and manage data

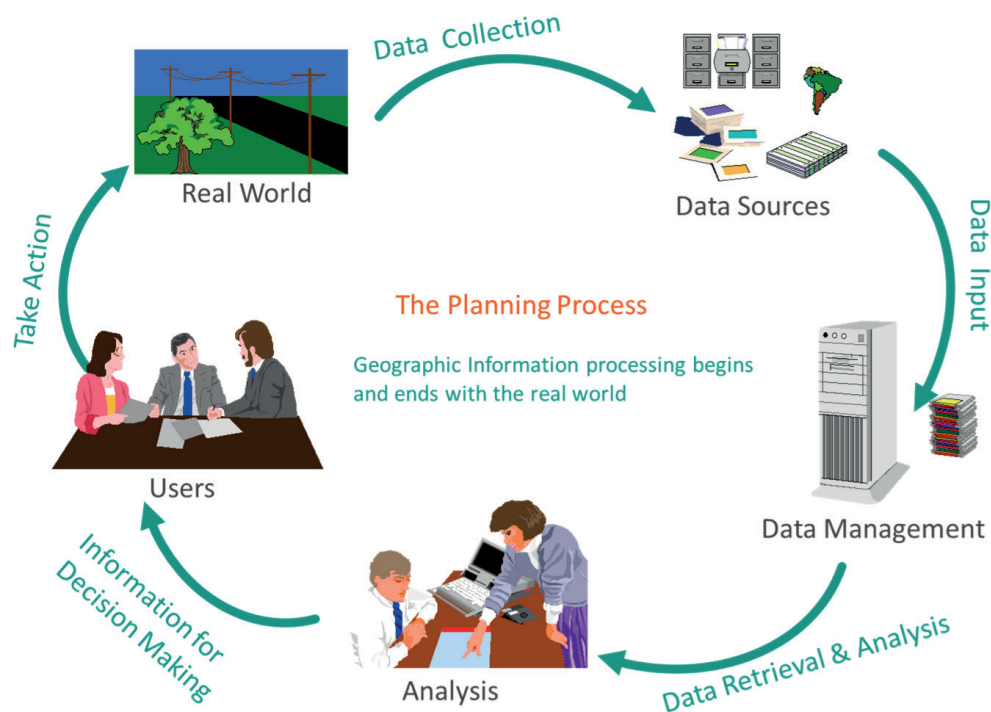


Figure 1: Basic process of how geographic information is processed assist in decision making

1.1 Objectives

The overall aim of the Field Data Collection Surveyor Manual is to increase the understanding and knowledge of collecting data on an open-source system called KoBoToolbox/KoBoCollect. Specifically, the purpose of this guide is to provide a comprehensive manual on how to use KoBoToolbox on the devices Trimble TDC600 and Samsung Galaxy Tab A. Through this manual, it is expected that the Kobo user will be able to:

- Understand basic concepts of using KoBoToolbox system (web platform & application) to collect survey data and export and download this data to eventually analyse and share as geospatial information.
- practically access data collection templates from Kobo Toolbox webpage and execute data collection in the field
- Effectively use KoboCollect application on the devices TDC600 and Samsung Galaxy Tab A (provided)

1.2 Terminology

Terms	Definition
Attribute	descriptive data often associated to specific features through geographic information. An attribute can contain information, for example, the estimated population of a city where the name of the attribute could be shortened POPEST for easy recognition of what the values of the attribute actually represent
Library	in order to simplify survey design and allow users and organisations to manage and re-use questions, the form builder integrates a question library. This allows prepared questions to be rapidly identified and inserted into a form as it is designed.
Form Builder	provides a simple click and drag interface for creating forms (survey questions)
Attribute Table	Table displaying all the attributes of a specific feature and their associated values
Project	Kobo allows users to create a project from scratch/ using a template/from an uploaded XLS form or import from an XLSForm via URL.
Template	a predefined page/question layout. Kobo allows the user to create templates of questions in order to collect data conveniently
Deploy	uploading of project/forms to the KoBoToolbox server from the web platform
GNSS	Global Navigation Satellite System , is a general term describing any satellite constellation that provides positioning, navigation, and timing (PNT) services on a global or regional basis.
GLONASS	Globalnaya Navigazionnaya Sputnikovaya Sistema/Global Navigation Satellite System is a global GNSS owned and operated by the Russian Federation. The fully operational system consists of 24+ satellites that works alongside GPS (Global Positioning System) to provide position information to compatible devices.
BDS	The BeiDou Navigation Satellite System (BeiDou/BDS) is a global GNSS owned and operated by the People's Republic of China. BDS was formally commissioned in 2020. The operational system consists of 35 satellites.
GPS	Global Positioning System is a satellite-based radionavigation system owned by the United States government and operated by the United States Space Force. It is one of the global navigation satellite systems (GNSS) that provides geolocation and time information to a GPS receiver anywhere on or near the Earth.
Galileo	Galileo is a global GNSS owned and operated by the European Union. The EU declared the start of Galileo Initial Services in 2016 and plans to complete the system of 24+ satellites in 2021.

1.3 KoBoToolbox

KoBoToolbox is a suite of tools for field data collection for use in challenging environments. KoBoToolbox software is free and open source. Most of its users are people working in humanitarian crises, as well as aid professionals and researchers working in developing countries. KoBo's teams of developers and researchers are based in Cambridge, MA and many other places around the world.

Quickly collecting reliable information in a humanitarian crisis – especially following a natural disaster such as a large earthquake or a typhoon taking place in a poor country – is the critical link to saving the lives of the most vulnerable. Understanding the population's needs is often neglected for lack of quick means to gather and analyse this crucial information. KoBoToolbox, developed by the Harvard Humanitarian Initiative, is an open-source suite of tools for data collection and analysis in humanitarian emergencies and other challenging environments that was built to address this gap. KoBoToolbox is funded entirely through generous grants and donations from our partners.

Additional information on KoBoToolbox can be found through the link below:
<https://support.kobotoolbox.org/>

1.4 Devices

a. Trimble TDC600

The Trimble TDC600 handheld is a sleek, all-in-one rugged smartphone with a built-in professional GNSS receiver. Designed for ease-of-use in a wide range of GIS and survey applications, the TDC600 helps you collect and retrieve highly accurate spatial information while staying in touch with the office—all with a single device. It's the smart, productive way to collect data and communicate from the field.

Key Features include:

- All-in-one GNSS data collector and smartphone
- Android 10 operating system
- 6-inch-high resolution sunlight-readable display
- Powerful Qualcomm processor with 4GB RAM and 64GB internal storage
- Large capacity, user replaceable all-day battery
- Real-time positioning with built-in GNSS receiver
- Google Mobile Services certified with access to Google Play store apps
- Ultra-rugged design with MIL-STD-810G certification
- 4G LTE, Wi-Fi, Bluetooth connectivity options for voice calls and data
- Ergonomic, lightweight and slim form factor
- Front-and rear-facing cameras
- Supports the Trimble Catalyst and Trimble Access, third-party or custom-developed field applications

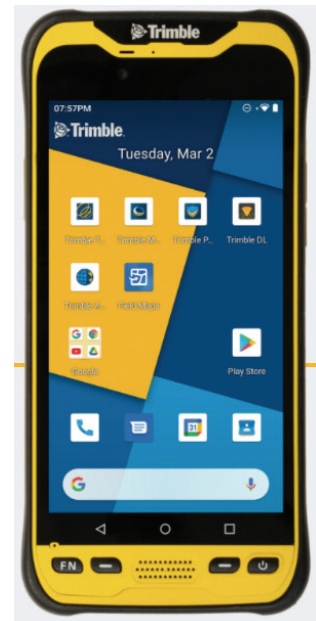


Figure 2: Trimble TDC600

A Quick Start Guide can be found through the link below:

https://trl.trimble.com/docushare/dsweb/Get/Document-915727/TrimbleTDC600_QSG_118864_RevA_SCREEN.pdf

b. Samsung Galaxy Tab A Tablet

The white/black 7.0" Tab A 8GB Tablet from Samsung delivers powerful performance and wireless content sharing in a sleek, modern design. This tablet is powered by a quad-core 1.3 GHz Snapdragon 410 processor and has 1.5GB of RAM. It comes equipped with 8GB of built-in storage, a micro-USB port for data sharing, and a microSDXC card slot that supports up to 200GB of additional storage capacity.

For high-speed Internet connectivity, Wi-Fi is built in. Bluetooth 4.0 connectivity is also integrated for wireless pairing with compatible devices, such as headphones and other Bluetooth-enabled accessories.

For more details on the Samsung Galaxy Tab A, follow the link below:

<https://www.samsung.com/us/mobile/tablets/galaxy-tab-a/samsung-galaxy-tab-a-7-0-8gb-wi-fi-black-sm-t280nzkaxar/#specs>



Figure 3: Samsung Galaxy Tab A

2.0 Setting Up KoBo Forms

2.1 Accessing Website

1. Insert the URL <http://www.kobotoolbox.org> into the Browser, the Kobo Toolbox homepage will appear OR search “Kobo Toolbox” on the Google Search bar (or current search engine). (Figure 4) The Kobo Toolbox Homepage (Figure 5) offers two options to getting started (i.e. Creating an account or Logging In). These are:
 - a) Unlimited Use for Humanitarian Organizations
 - b) Researchers, Aid Workers & Everyone Else

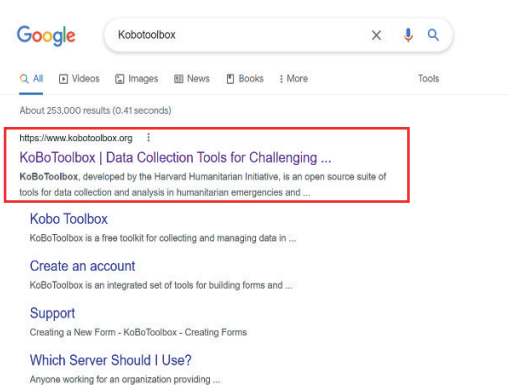


Figure 4: Search for KoBoToolbox on Google/available search engine

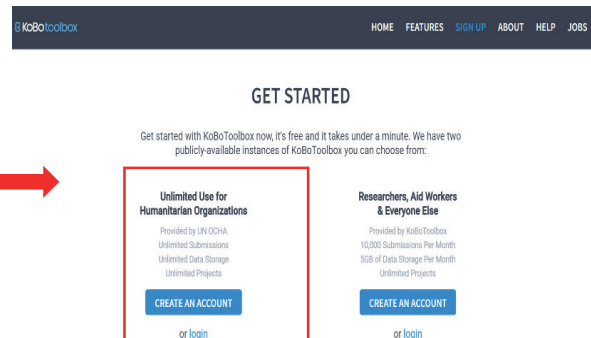


Figure 5: KoBoToolbox Home Page

2. Click on “Log in” for Unlimited Use for Humanitarian Organizations

2.2 Signing In

1. Click on “Login” under option 1; this will take you to the login page (Figure 6) whereby you can login into the PCRAFI II account with the following details (in order to access PCRAFI II Data Collection Templates): Note that you have to log in to your respective country’s KoBo account. If you have created your own account, then you can login with your own credentials.

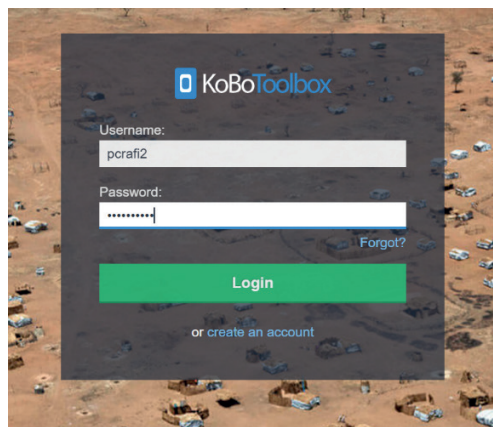




Figure 6: KoBoToolbox Login Page

Username: pcrafi2
Password: pcrafi2020

2. There are five main links at the top (left-right) of the homepage (Figure 7): Projects, Library, Home Page, Search Tab and User details. These links are permanent, allowing you to easily navigate between different interfaces without necessarily returning to the homepage.
 - a. Projects  – user can view current projects saved under the account
 - b. Library  – user can view/edit templates already created under the account
 - c. Home – allows user to revert back to Home Page
 - d. Search – allows user to search for projects under the account
 - e. User Details – user can view/edit account settings, change language, and logout of current account

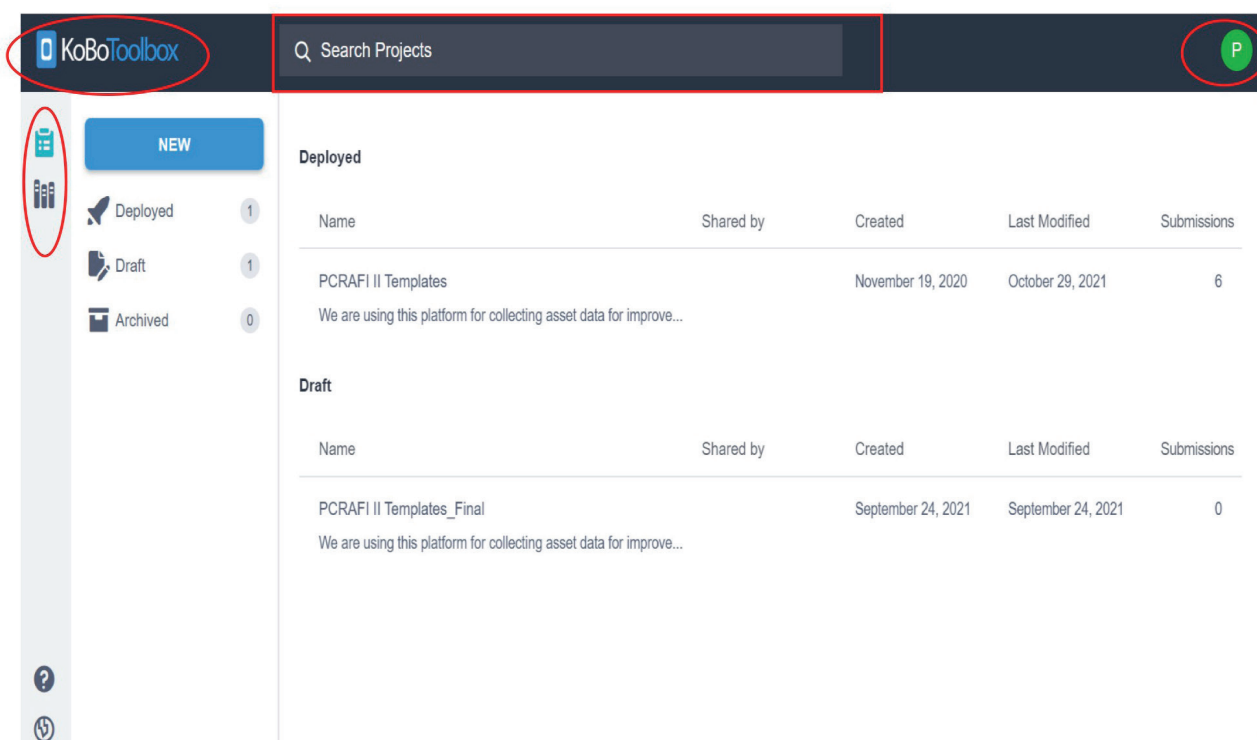


Figure 7: KoBoToolbox PCRAFI II account

2.3 Selecting Project

1. Click on the “Project” tab to access/view projects under the user account. There are four main tabs that appear on the left corner. These are (Figure 8):
 - a. New – to create a new project
 - b. Deployed – projects that have been deployed from the Kobo Server (accessible to devices to begin data collection)
 - c. Draft – projects that have not been deployed yet
 - d. Archived – forms that are no longer in use for data collection (prevents using the wrong forms especially in large teams of data collectors)
2. As seen in Figure 8, the right-hand side gives a brief description of the projects that have been deployed and those that are still in its draft stage (yet to be deployed).

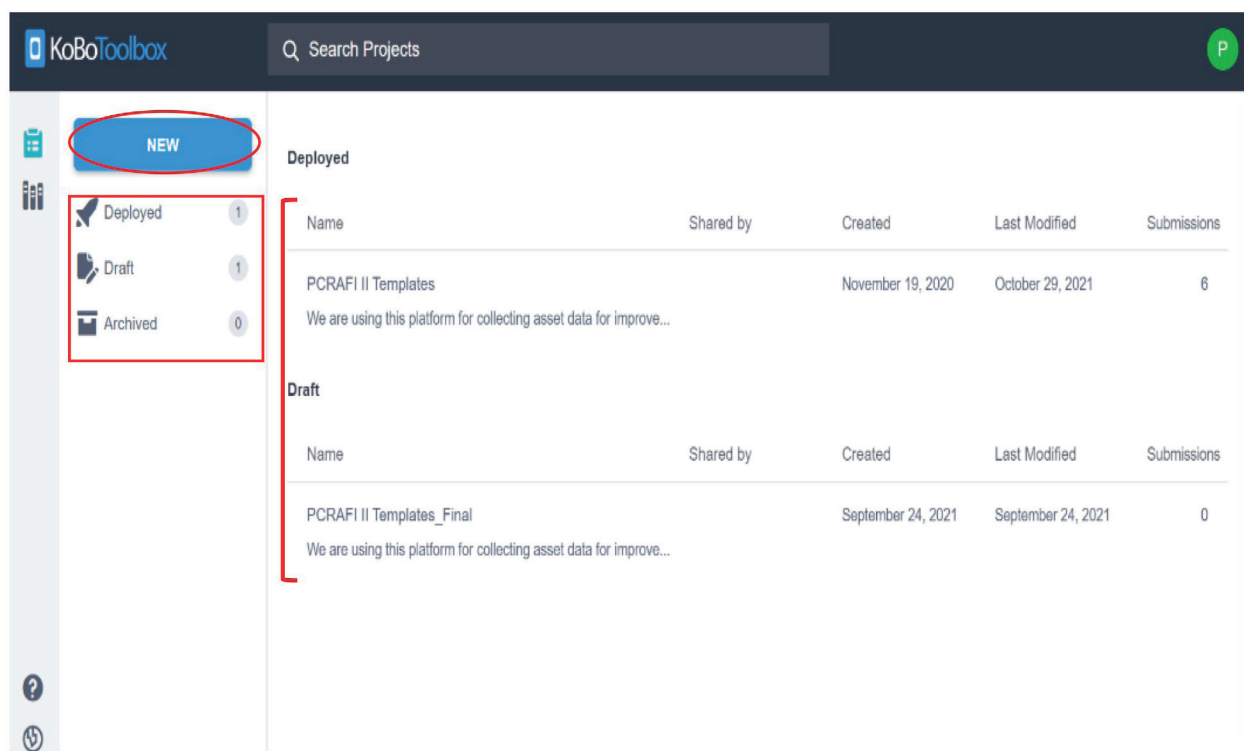


Figure 8: KoBoToolbox project tabs

3. Click on "PCRAFI II Template" to view/access PCRAFI II Data Collection Templates.

3.0 Accessing Kobo Toolbox Application

3.1 Samsung Galaxy Tablet A

i. Application Installation

1. For android users; search for “KoBoCollect” under the Google Playstore/Galaxy Store. Download the application. (Figure 9)

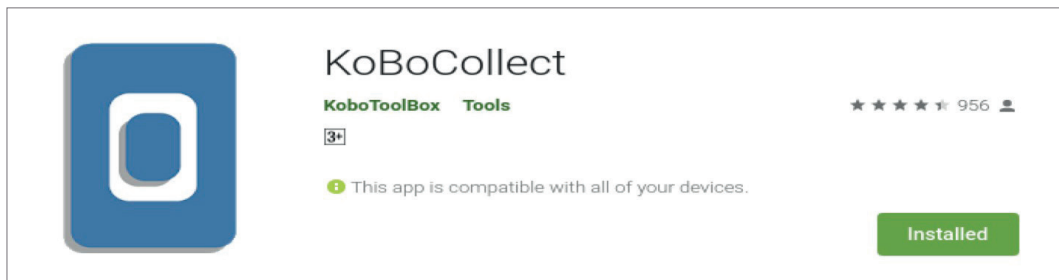


Figure 9: KoBoCollect application on Google Playstore

ii. Location Settings

1. Once the KoBoCollect app has been installed, access the “Settings” tab for the tablet. Click on “Privacy” and switch “Location” On. (Figure 10)
2. By clicking on “Locating Method” the user can also select (Figure 11) from three options available for estimating location:
 - a. GPS and Wi-Fi (preferrable option if Wi-Fi is also available)
 - b. Wi-Fi only
 - c. GPS only

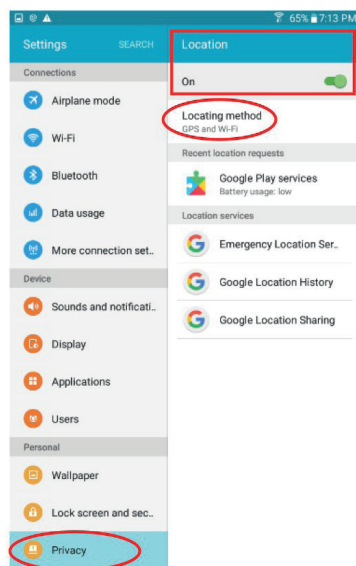


Figure 10: Samsung Galaxy Tab A Settings - turning Location “On”

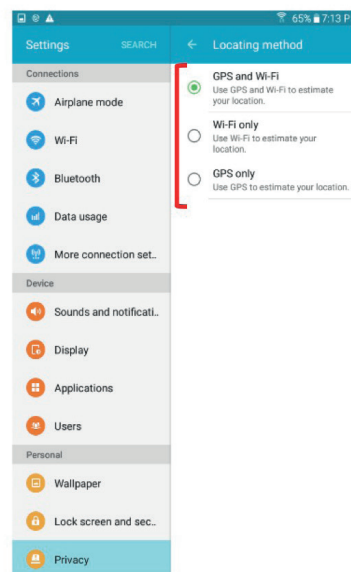



Figure 11: Samsung Galaxy Tab A - Selecting Locating Method

iii. Accessing Server (App Server Configuration (PCRAFI II Templates))

1. Once location settings have been adjusted; click on the KoboCollect application. The following interface will appear. (Figure 12) Click on the icon  on the top right-hand corner of the page, then click on "General Settings" (Figure 13).

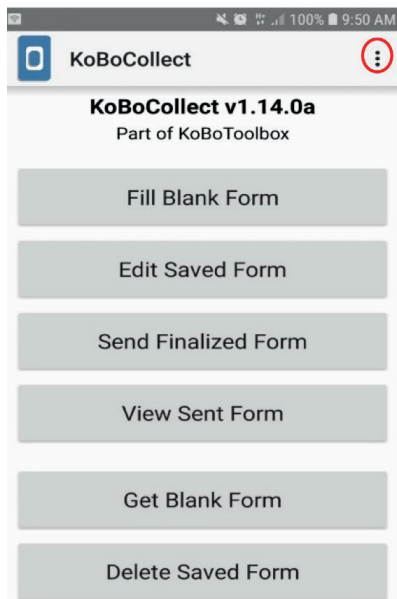


Figure 12: KoBoCollect Interface - Server Configuration

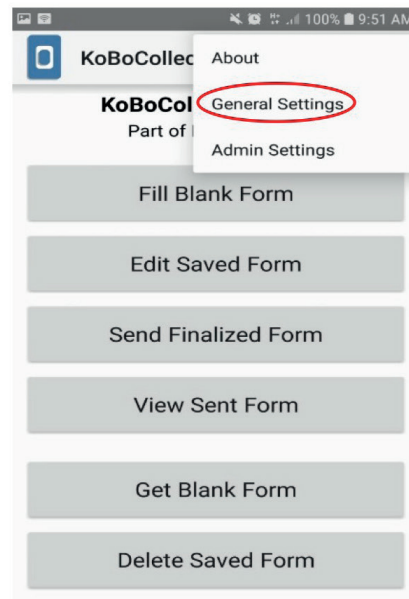


Figure 13: KoBoCollect Interface - Accessing General Settings

2. Once on General Settings, click on "Server Settings" in order to enter details and access PCRAFI II account containing the PCRAFI II data collection templates (Figure 14). Enter username and password (Figure 15).

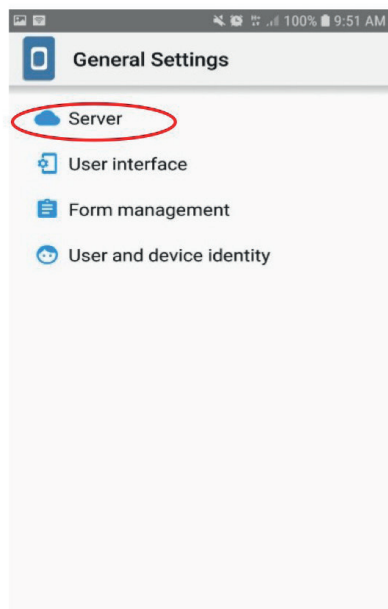


Figure 14: KoBoCollect Application Server Settings

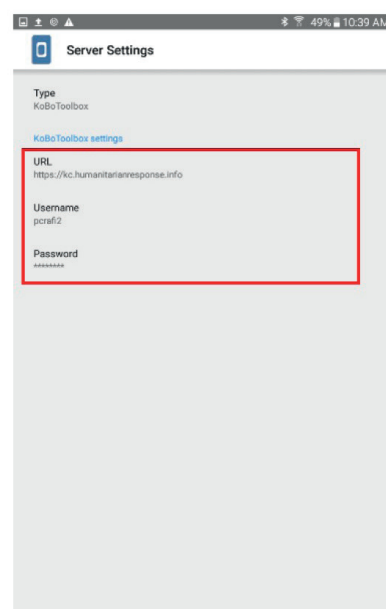


Figure 15: KoBoCollect Application - configuring Server Settings

iv. Selecting and Deploying Form(s)

1. Click on the “Return” button on the device to head back to the Home Page. Once on Home Page (Figure 16), the following tabs will be visible:
 - a. Fill Blank Form – allows the user to begin data collection using a blank form of a template/project deployed from the server
 - b. Edit Saved Form – allows user to edit form(s) that have been previously saved and not finalized yet
 - c. Send Finalized Form – allows user to send/upload finalized forms to the server, in order to view/edit/download data collected on the Kobo Toolbox web platform
 - d. View Sent Form – user is able to view forms that have been uploaded to the server
 - e. Get Blank Form – allows user to download forms that have been created on the Kobo Toolbox web platform
 - f. Delete Saved Form – user is able to delete saved forms

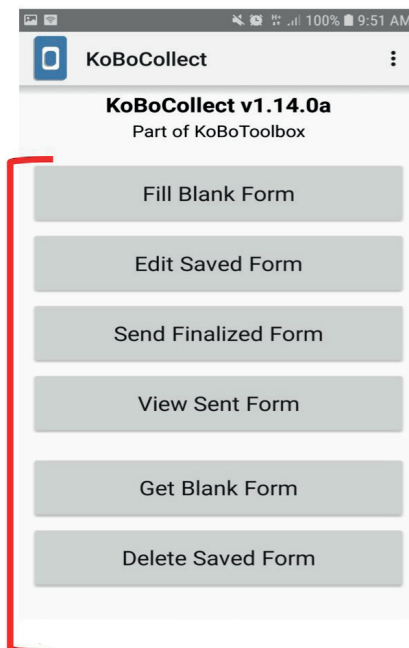


Figure 16: KoBoCollect Home Page

2. Click on “Get Blank Form” and the following interface will appear (Figure 17). The “PCRAFI II Templates” option should appear.

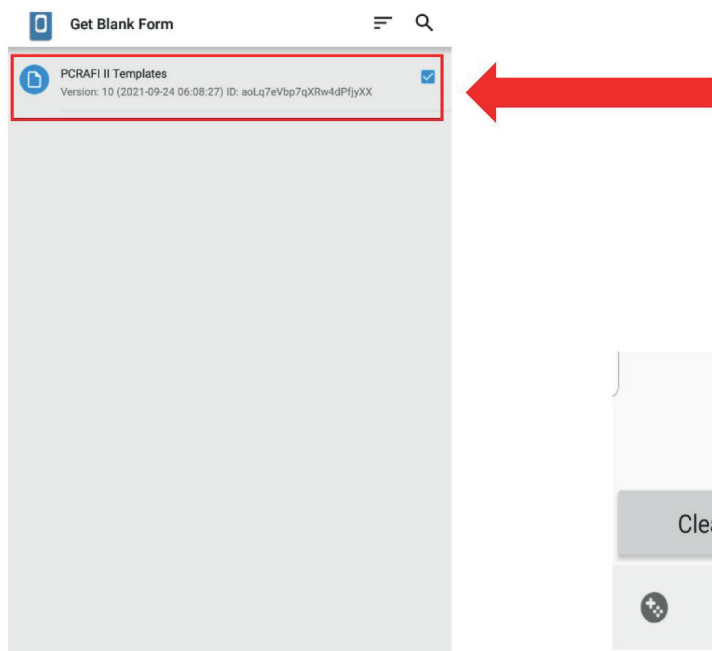


Figure 17: KoBoCollect Application - Get Blank Form

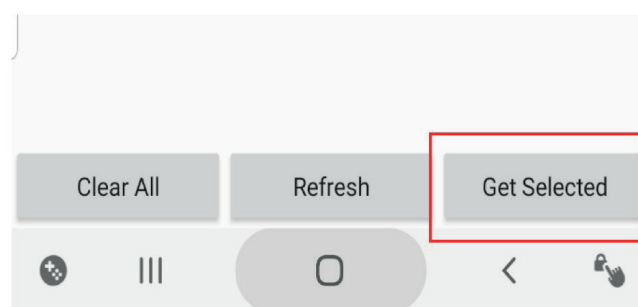


Figure 18: KoBoCollect Application - Get Blank Form (Get Selected) (appears below page)

3. Tick the box “PCRAFI II Templates” and then click on “Get Selected” at the bottom of the page; in order to get access to PCRAFI II Data Collection Templates from the server. (note: If the template does not appear, click on refresh (bottom of page) or re-deploy PCRAFI II project on Kobo Toolbox web browser)
4. Once this is done a notification of the templates being successfully downloaded should appear (Figures 20-21); you can then click on the “Return” button on the device to head back to the Home Page.

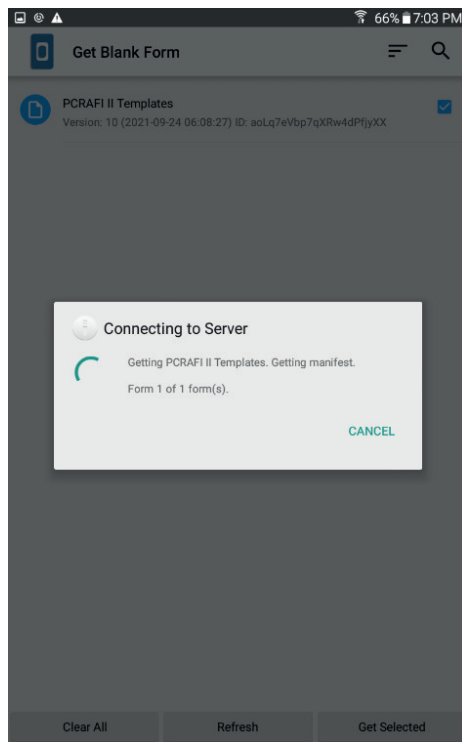


Figure 19: KoBoCollect Application - Connecting to Server

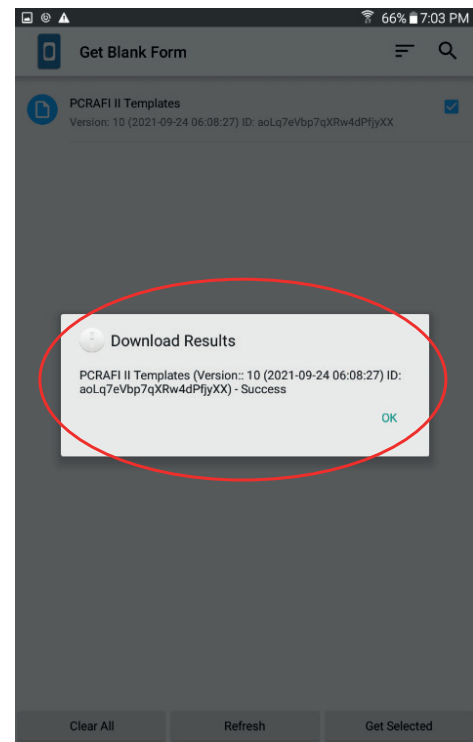


Figure 20: KoBoCollect Application - Successful download of PCRAFI II Templates

3.2 Trimble TDC600

i. Application Installation

1. For android users; search for "KoBoCollect" under the Google Playstore/Galaxy Store. Download the application. (Figure 21 and Figure 22)

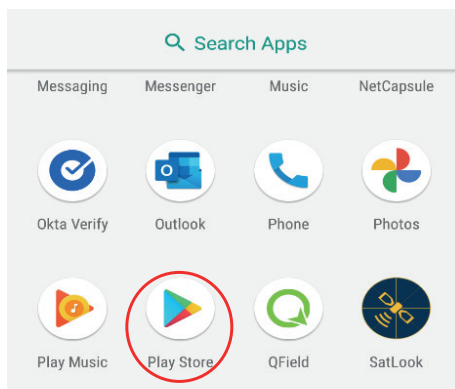


Figure 21: Trimble TDC600 interface - download from Google Playstore

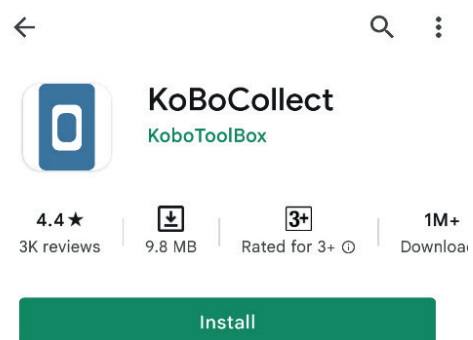


Figure 22: Trimble TDC600 - KoBoCollect Application download

ii. Location Settings

1. Once the KoBoCollect app has been installed, access the "Settings" tab for the TDC600. Click on "Security & Location". (Figure 23/Figure 24)
2. By clicking on "Security & Location" the user has access to Location settings. (Figure 24) Click on "Location" under sub-tab "Privacy" to access settings for accuracy, GNSS, NMEA, SBAS and GALILEO modes. (Figure 25)

3. Three options will appear when adjusting the “Location mode” (Figure(s) 26-27). These are:
 - a. High accuracy – Use GPS, Wi-Fi, Bluetooth, or mobile networks to determine location
 - b. Battery saving – Use Wi-Fi, Bluetooth, or mobile networks to determine location
 - c. Device only – Use GPS to determine location
4. Similarly, the following options appear when the user clicks on “GNSS Mode” (Figure 28):
 - a. GPS + BDS (Chinese Satellite Navigation system)
 - b. GPS + GLONASS (reconstructed Russian satellite navigation system)
 - c. GPS (American Satellite Navigation System)

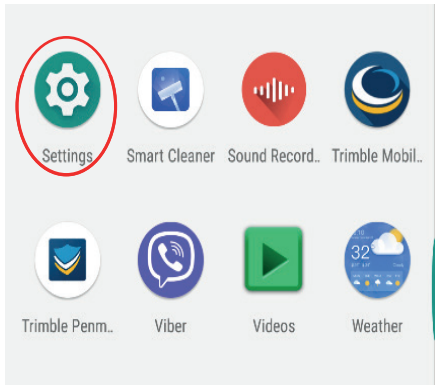


Figure 23: Accessing “Settings” on Trimble TDC600

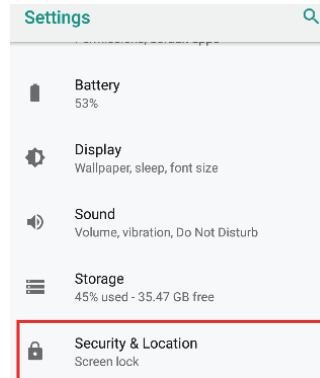


Figure 24: Trimble TDC600 - Security & Location settings

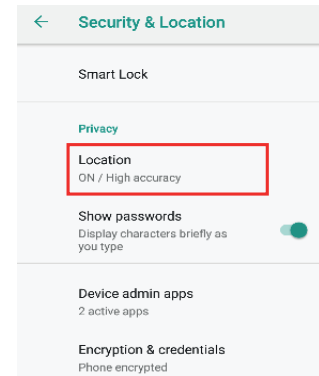


Figure 25: Trimble TDC600 - Location Accuracy settings

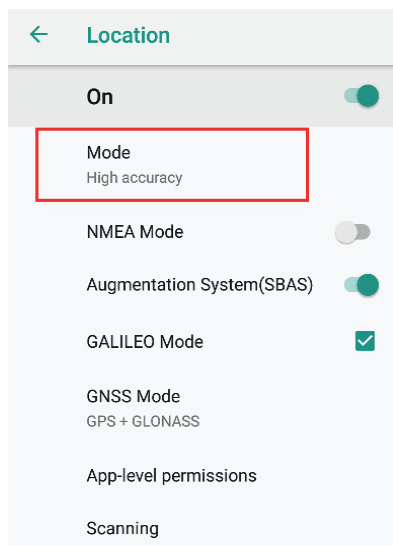


Figure 26: Trimble TDC600 - Location Accuracy Mode

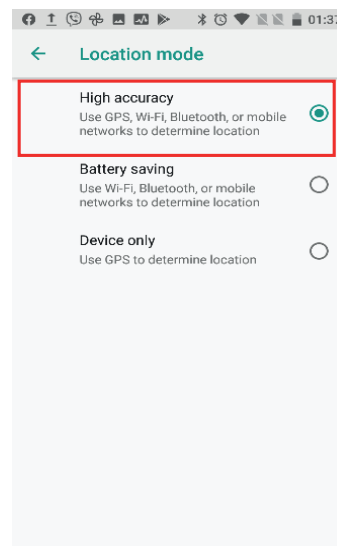


Figure 27: Trimble TDC600 - Selecting Location accuracy mode

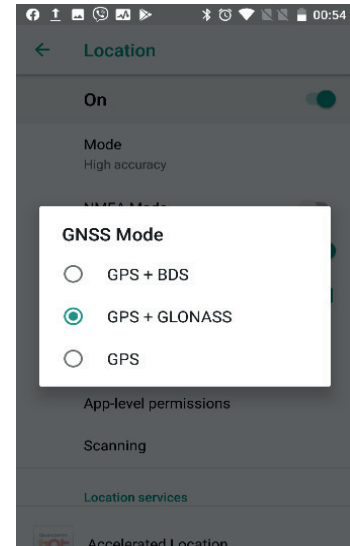



Figure 28: Trimble TDC600 - GNSS modes

iii. Accessing Server

1. Once location settings have been adjusted; click on the KoboCollect application. The following interface will appear. (Figure 29) Click on the icon  on the top right-hand corner of the page, then click on "Settings" (Figure 30).

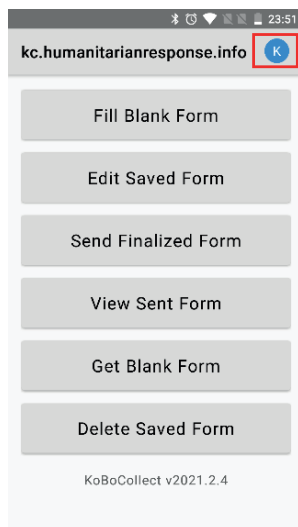


Figure 29: KoBoCollect - Home interface

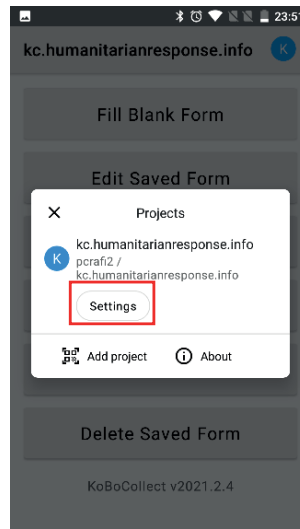


Figure 30: KoBoCollect - Accessing Settings

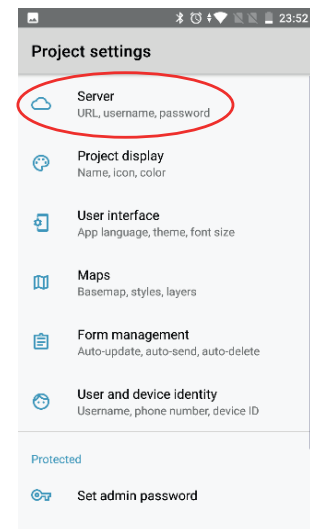


Figure 31: KoBoCollect - Accessing Server Settings

2. Once on Project Settings, click on "Server" in order to enter details and access the PCRAFI II account containing the PCRAFI II data collection templates (Figure 31). Enter username and password (Figure(s) 32-33).

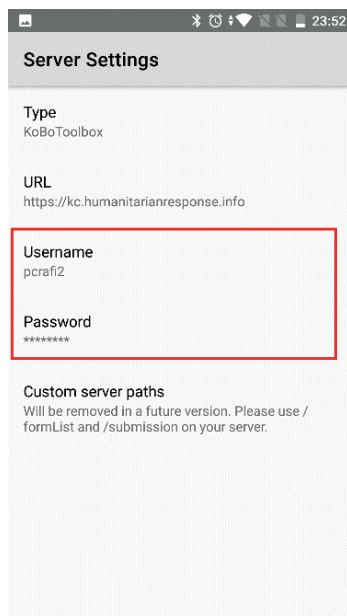


Figure 32: KoBoCollect - Entering "PCRAFI II" server details

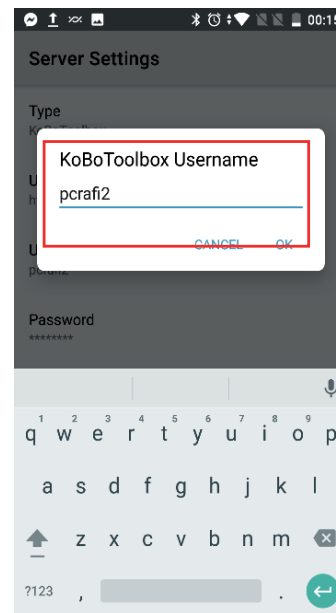


Figure 33: KoBoCollect - Username for PCRAFI II account, followed by password

iv. Selecting and Deploying Form(s)

1. Click on the “Return” button on the device to head back to the Home Page. Once on Home Page (Figure 34), the following tabs will be visible:
 - a. Fill Blank Form – allows the user to begin data collection using a blank form of a template/project deployed from the server
 - b. Edit Saved Form – allows user to edit form(s) that have been previously saved and not finalized yet
 - c. Send Finalized Form – allows user to send/upload finalized forms to the server, in order to view/edit/download data collected on the Kobo Toolbox web platform
 - d. View Sent Form – user is able to view forms that have been uploaded to the server
 - e. Get Blank Form – allows user to download forms that have been created on the Kobo Toolbox web platform
 - f. Delete Saved Form – user is able to delete saved forms

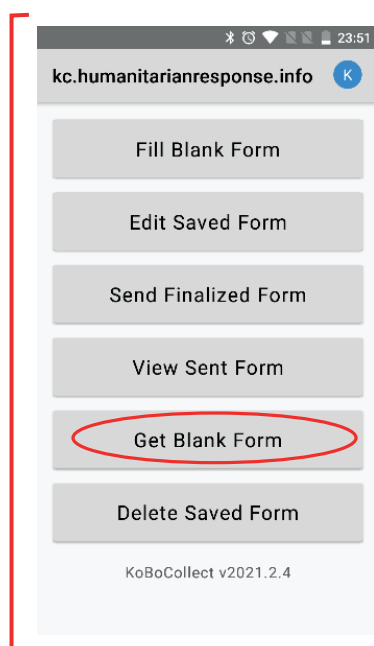


Figure 34: KoBoCollect - Get Blank Form

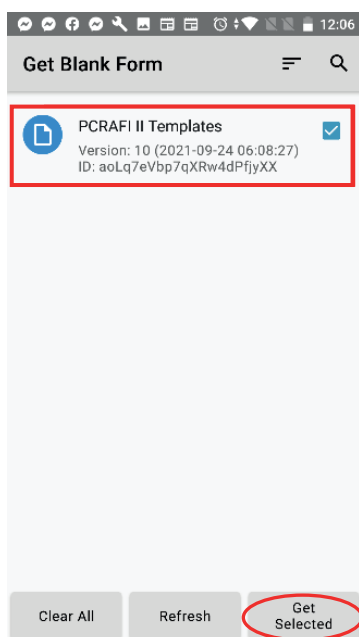


Figure 35: KoBoCollect - Select “PCRAFI II Templates”

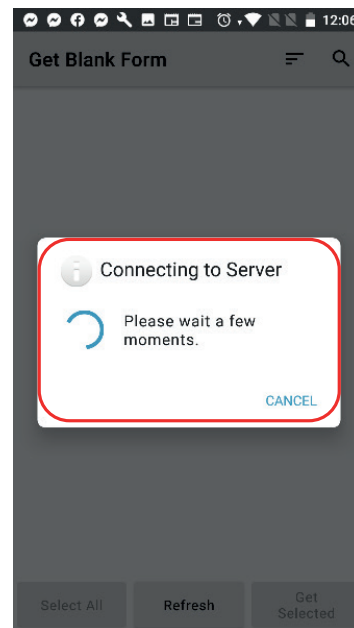


Figure 36: KoBoCollect - Get Blank Form (connecting to server)

2. Click on “Get Blank Form” and the following interface will appear (Figure(s) 34-35). The “PCRAFI II Templates” option should appear.
3. Tick the box “PCRAFI II Templates” and then click on “Get Selected” at the bottom of the page; in order to get access to PCRAFI II Data Collection Templates from the server. (note: If the template does not appear, click on refresh (bottom of page) or re-deploy PCRAFI II project on Kobo Toolbox web browser)
4. Once this is done a notification of the templates being successfully downloaded should appear (Figures 37); you can then click on the “Return” button on the device to head back to the Home Page.

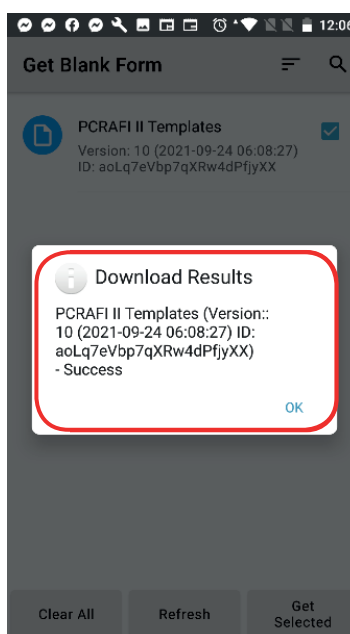


Figure 37: KoBoCollect - Successful download of form from server

4.0 Data Collection

4.1 Samsung Galaxy Tab A

a. Selecting Blank Form

1. Click on “Fill Blank Form”. (Figure 38).
2. Select “PCRAFI II Templates” and click on “Get Selected” at the bottom of the page. (Figure 39) (Note: Kobo will automatically open the first template which is the “Building Attribute” template: Collect GPS point – Figure 40)

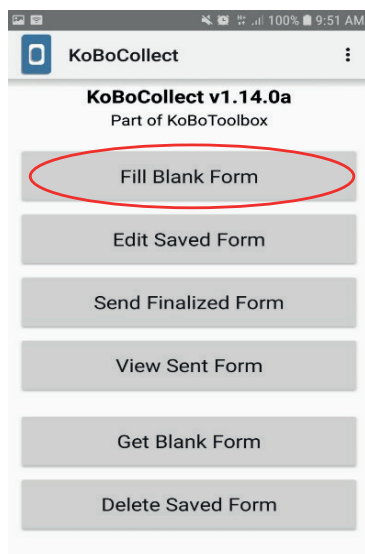


Figure 38: KoBoCollect Fill Blank Form

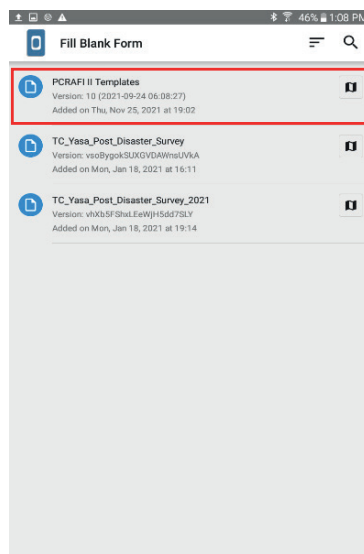


Figure 39: KoboCollect - Selecting Blank Form

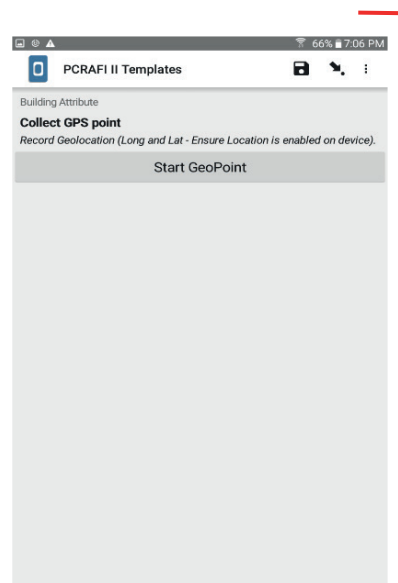


Figure 40: Default-first attribute in Template opens

b. Collecting GPS Coordinates

1. The following interface will appear when collecting GPS coordinates (Figure 41). Click on “Start GeoPoint” in order to begin collection of GPS points.
2. Ensure that you are standing as close as possible to the building/structure whilst avoiding any overhead obstruction.
3. Stand at point for 3-5mins in order to obtain an accurate location. (Figure 42) Once you are satisfied with the accuracy range (<5m), click on “SAVE GEOPOINT”.
4. To edit the location, click on “Change Location” and it will begin processing the location again. Repeat Steps 2-3 (Figure 43).

c. Capturing Photos

1. Take a photo of the building/structure at an angle that it covers the asset. The photo needs to be clear enough to be able to see the condition and various components of the building/structure
2. There are two options available for capturing/inserting photos. As seen in Figure 44, the first option is to “Take Picture”. The second is to “Choose Image”, to choose an existing photo that is in the device.
3. Once the photo has been captured/chosen, a preview of the image will appear at the bottom. (Figure 45)



Figure 41: KoBoCollect App – Collecting GPS Points

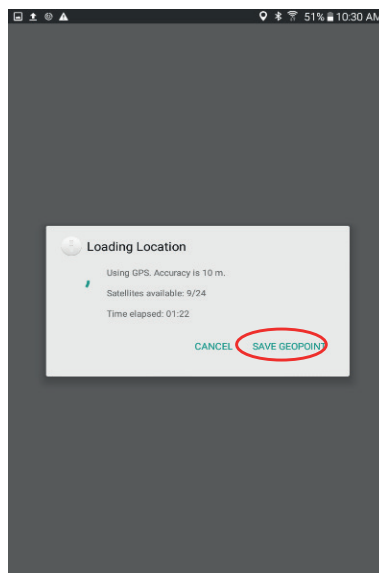


Figure 42: KoBoCollect App – Saving GeoPoint

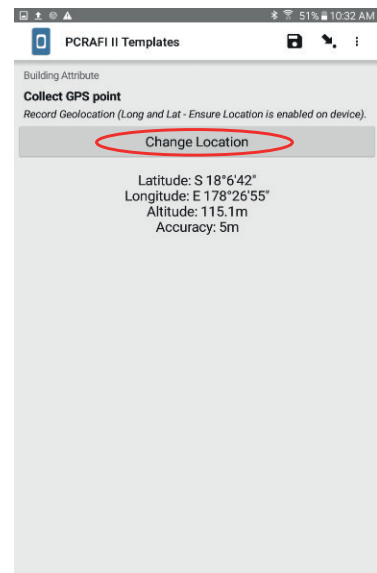


Figure 43: KoBoCollect App - Change Location

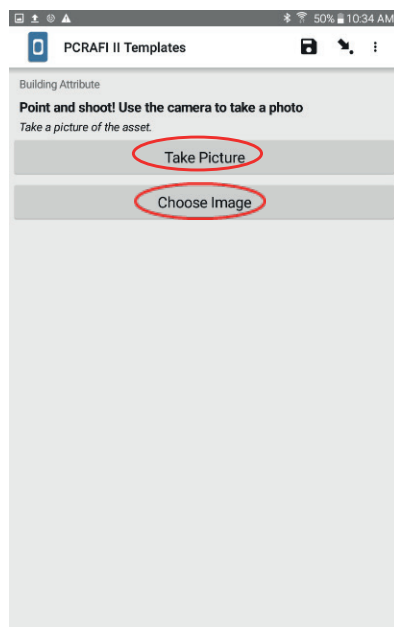


Figure 44: KoBoCollect App - Taking a picture/Choosing a photo

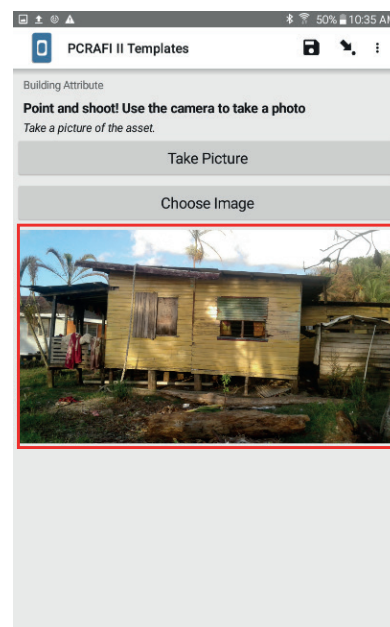


Figure 45: KoBoCollect App - Photo Preview

d. Manoeuvring Through the Templates




1. Once the templates have been accessed, the following menu will appear on the top (Figure 46).
2. The  icon allows the user to visit the "General Settings" menu; whereby the user can edit Server, User Interface, Maps, Form Management, and User and Device Identity settings.
3. The  (Save) icon allows the user to save the data collected at any point of the data collection process.
4. The , allows the user to view the rest of the attributes/questions included in the current template. (e.g., Figure 47) Kobo also allows the user to skip directly to the beginning or ending of the template by clicking on the "Go To Start" and "Go To End" tabs at the bottom of the page. (Figure 47)
5. To move onto the next question/access the previous question within a template, the user can also swipe either left or right (Figure 48)



Figure 46: KoBoCollect Application - Template Menu Bar (insert: Zoomed portion of Menu Bar)

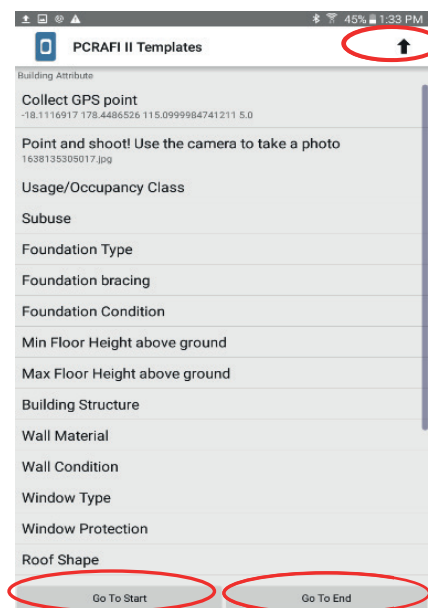
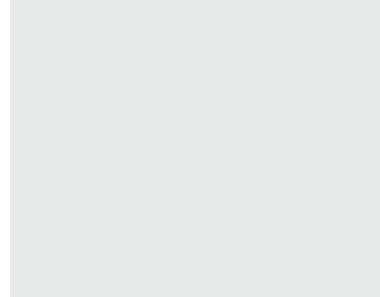


Figure 47: KoBoCollect App - View of "all" questions in current attribute

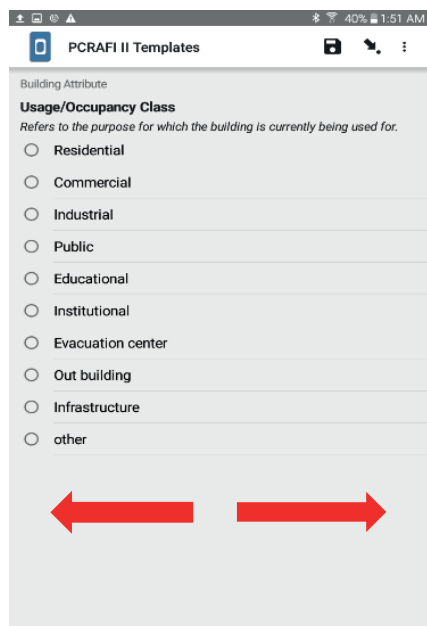



Figure 48: KoBoCollect App - User is able to swipe (left-right) from question to question

6. The  allows the user to view ALL the templates that are present within "PCRAFI II Templates". (Figure(s) 47 & 49)

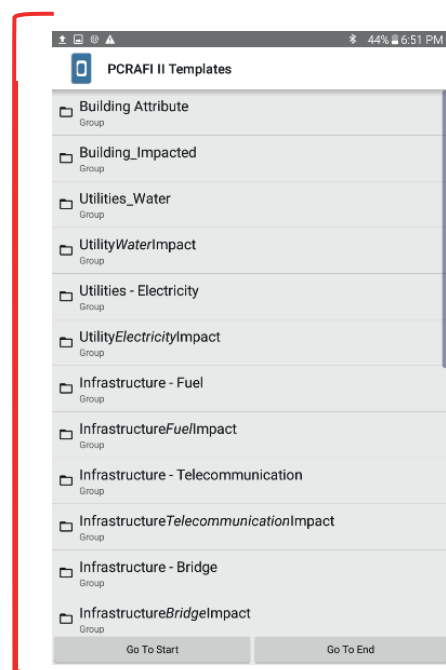


Figure 49: KoBoCollect App - Overview of "all" templates within PCRAFI II Template

e. Form Completion

1. Once data collection is completed; in order to complete the form, the user can save the form and exit. This can be done by clicking on the “Go To End” tab, or by manually swiping through all the templates. (Figure 50)
2. Once at the end, the following interface will appear. (Figure 51) At this point, the user is able to rename the form filled and mark the form as finalized.
3. Once the form is marked as finalized, it will be found under the “Send Finalized Form” tab on the Home Page; in addition to this the user will not be able to edit it on the device. If this option is not ticked, the form will be found under the “Edit Saved Form” on the Home Page, whereby it can be edited on the device. (Figure 52)
4. Click on “Save Form and Exit”

f. Sending Form to Server

Click on “Send Finalized Form” (Figure 51). Select name of form filled (e.g., PCRAFI II Templates) and then click on “Send Selected”. (Figure 53) The following message will appear once the form has been successfully sent/uploaded to the server. (Figure 54) Thi

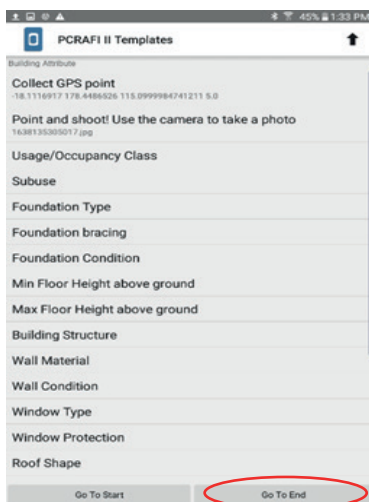


Figure 50: KoBoCollect App - Completing the Form

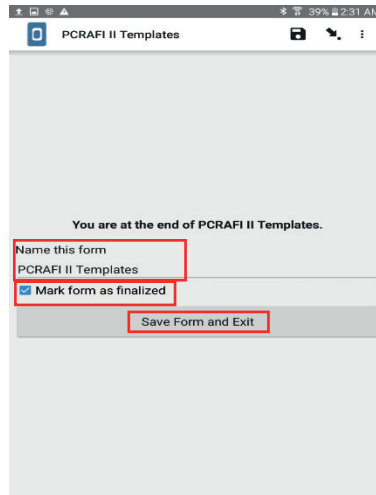


Figure 51: KoBoCollect App - Saving Form and exiting data collection

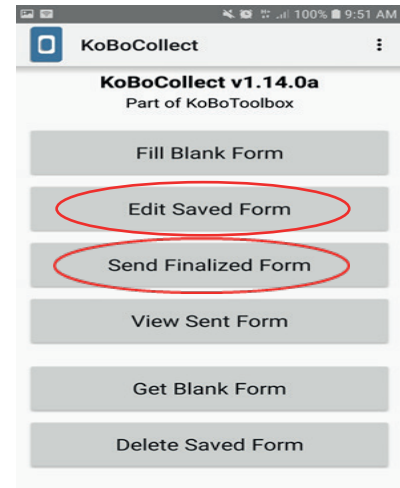


Figure 52: KoBoCollect App - Accessing Saved and Finalized Forms

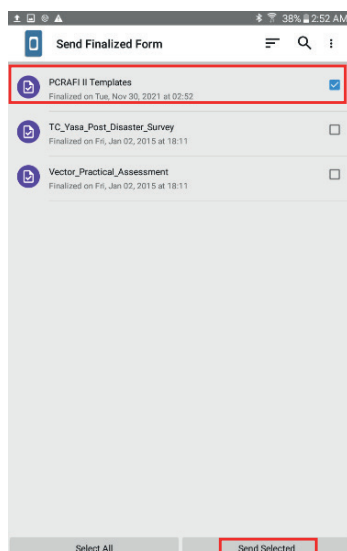


Figure 53: KoBoCollect App - Selecting Finalized form to upload to Server

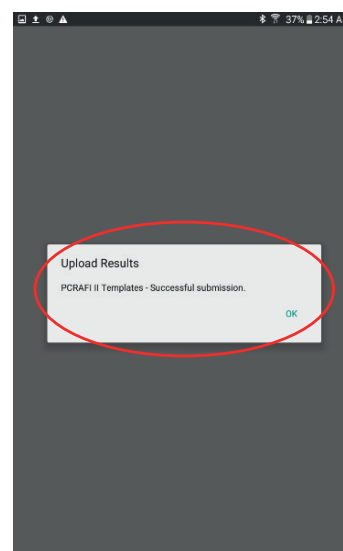


Figure 54: KoBoCollect App - Message appears once successfully uploaded

4.2 Trimble TDC600

a. Selecting Blank Form

1. Click on "Fill Blank Form". (Figure 55).
2. Select "PCRAFI II Templates" and click on "Get Selected" at the bottom of the page. (Figure 56) (Note: Kobo will automatically open the first template which is the "Building Attribute" template: Collect GPS point – Figure 57)

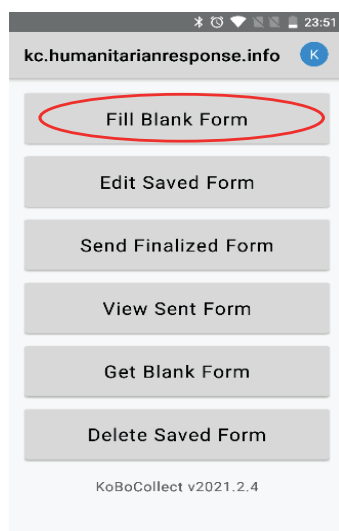


Figure 55: KoBoCollect - Fill Blank Form (beginning data collection)

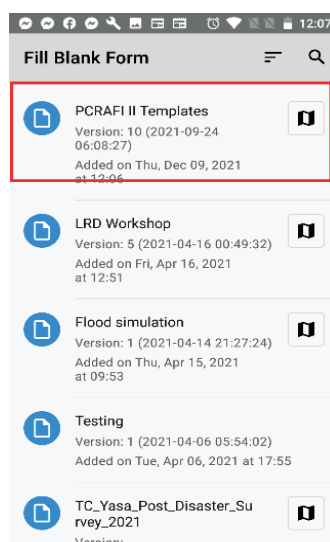


Figure 56: KoBoCollect - Selecting Blank Form

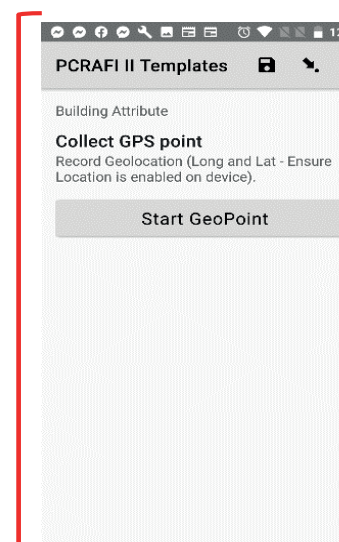


Figure 57: Default - first attribute in template selected opens

b. Collecting GPS Coordinates

1. The following interface will appear when collecting GPS coordinates (Figure 58). Click on "Start GeoPoint" in order to begin collection of GPS points.
2. Ensure that you are standing as close as possible to the building/structure whilst avoiding any overhead obstruction.
3. Stand at point for 3-5mins in order to obtain an accurate location. (Figure 59) Once you are satisfied with the accuracy range (<5m), click on "SAVE GEOPOINT".
4. To edit the location, click on "Change Location" and it will begin processing the location again. Repeat Steps 2-3 (Figure 60).

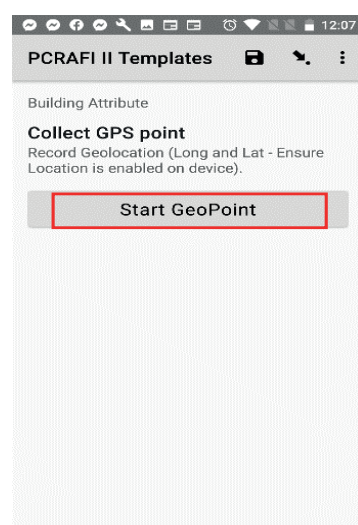


Figure 58: KoBoCollect - Collecting GPS points

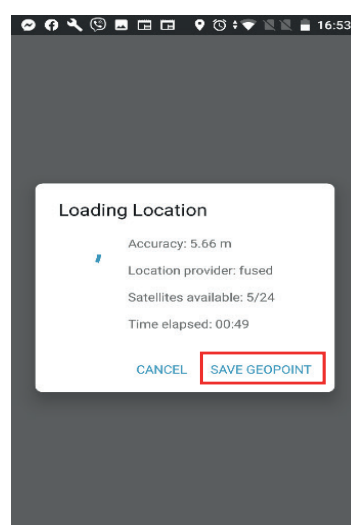


Figure 59: KoBoCollect - Saving GeoPoint

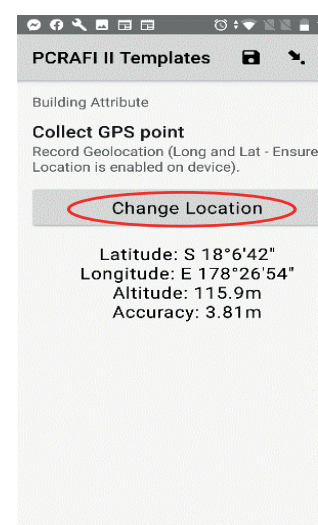


Figure 60: KoBoCollect - Editing Location once saved

c. Capturing Photos

1. Take a photo of the building/structure at an angle that it covers the asset. The photo needs to be clear enough to be able to see the condition and various components of the building/structure
2. There are two options available for capturing/inserting photos. As seen in Figure 61, the first option is to "Take Picture". The second is to "Choose Image", to choose an existing photo that is in the device.
3. Once the photo has been captured/chosen, a preview of the image will appear at the bottom. (Figure 63)

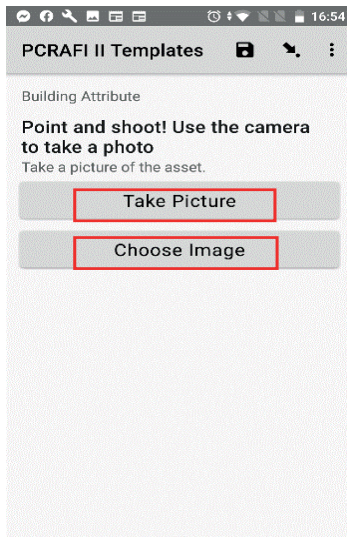


Figure 61: KoBoCollect - Taking a picture/Choosing a photo



Figure 62: KoBoCollect - Capturing a photo

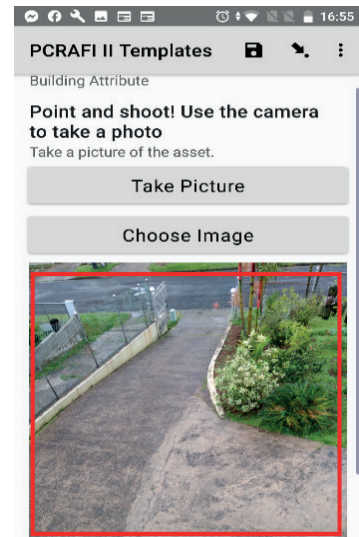



Figure 63: KoBoCollect - Photo Preview

d. Manoeuvring Through the Templates

1. Once the templates have been accessed, the following menu will appear on the top (Figure 64).
2. The  icon allows the user to visit the "General Settings" menu; whereby the user can edit Server, User Interface, Maps, Form Management, and User and Device Identity settings.

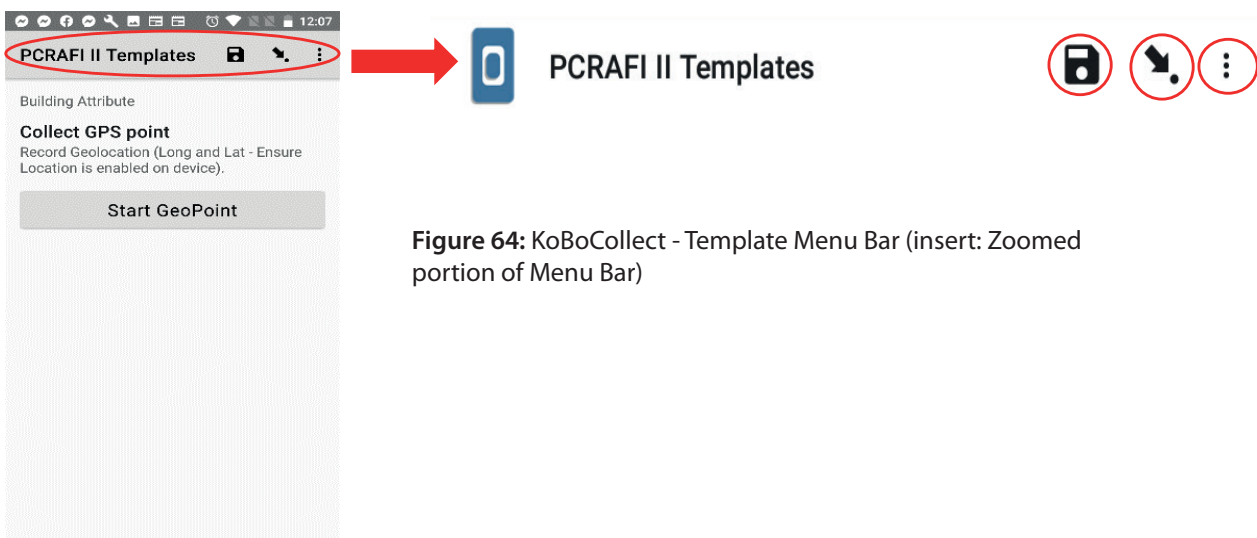





Figure 64: KoBoCollect - Template Menu Bar (insert: Zoomed portion of Menu Bar)

3. The  (Save) icon allows the user to save the data collected at any point of the data collection process.
4. The  allows the user to view the rest of the attributes/questions included in the current template. (eg. Figure 65) Kobo also allows the user to skip directly to the beginning or ending of the template by clicking on the "Go To Start" and "Go To End" tabs at the bottom of the page. (Figure 65)

- To move onto the next question/access the previous question within a template, the user can also swipe either left or right (Figure 66)
- The  allows the user to view ALL the templates that are present within "PCRAFI II Templates". (Figure(s) 65 & 67)

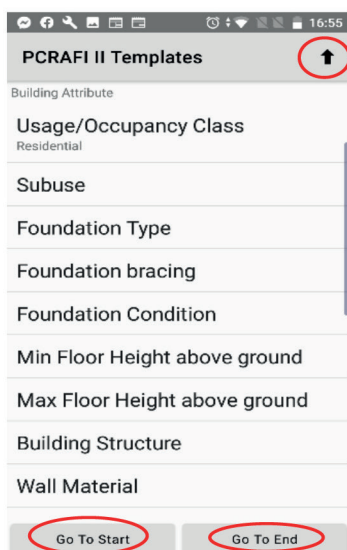


Figure 65: KoBoCollect - View of "all" questions in current attribute

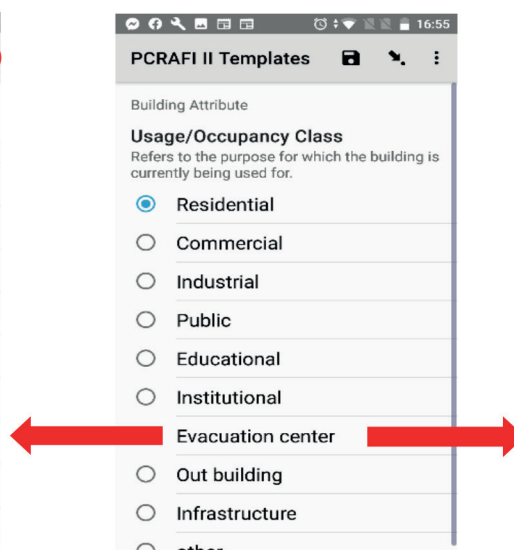


Figure 66: KoBoCollect - User is able to swipe (left/right) from question to question

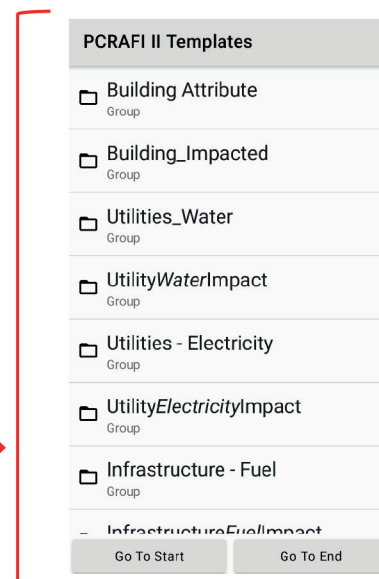


Figure 67: KoBoCollect - Overview of "all" templates within PCRAFI II Template

e. Form Completion

- Once data collection is completed; in order to complete the form, the user can save the form and exit. This can be done by clicking on the "Go To End" tab, or by manually swiping through all the templates. (Figure 68)
- Once at the end, the following interface will appear. (Figure 69) At this point, the user is able to rename the form filled and mark the form as finalized.
- Once the form is marked as finalized, it will be found under the "Send Finalized Form" tab on the Home Page; in addition to this the user will not be able to edit it on the device. If this option is not ticked, the form will be found under the "Edit Saved Form" on the Home Page, whereby it can be edited on the device. (Figure (s) 69-70)

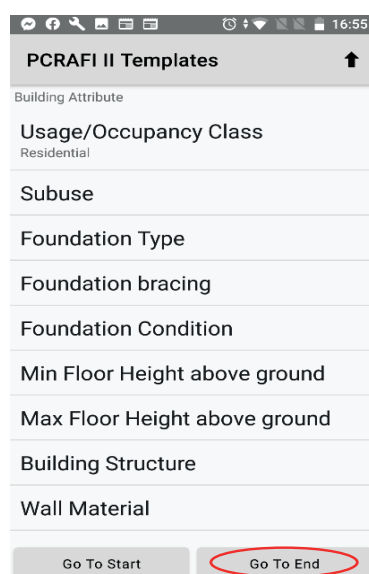


Figure 68: KoBoCollect - Completing the Form

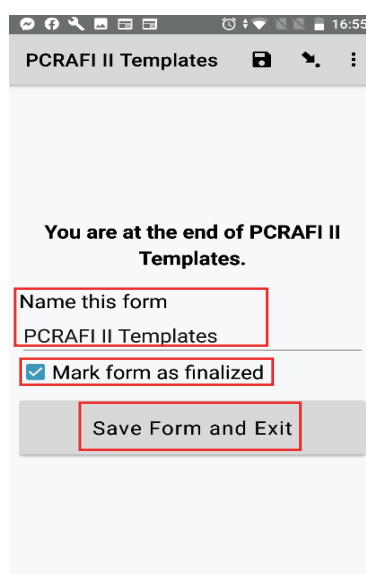


Figure 69: KoBoCollect - Saving Form and exiting data collection

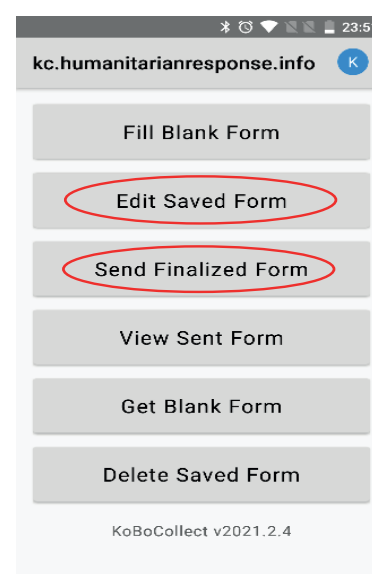


Figure 70: KoBoCollect - Accessing Saved and Finalized Forms

4. Click on “Save Form and Exit”.
5. Click on “Send Finalized Form” (Figure 70). Select name of form filled (eg. PCRAFI II Templates) and then click on “Send Selected”. (Figure 71) The following message will appear once the form has been successfully sent/uploaded to the server. (Figure 72)

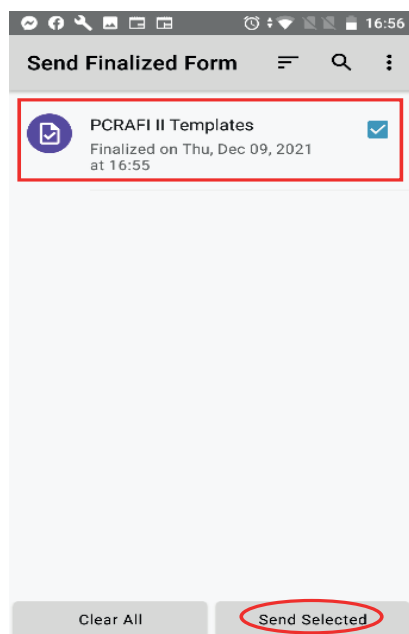


Figure 71: KoBoCollect - Selecting Finalized form to upload to Server

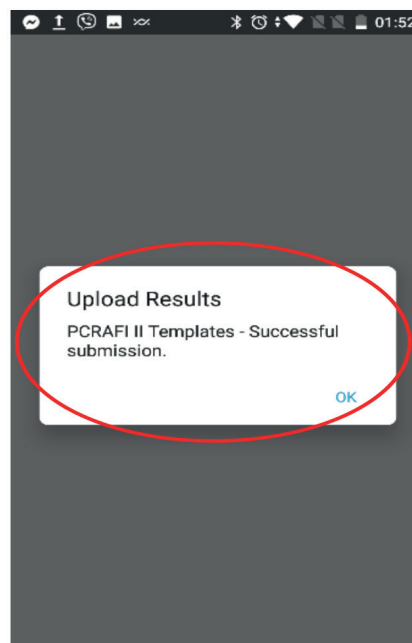


Figure 72: KoBoCollect - Message that appears once successfully uploaded Finalized form to server

5.0 Accessing & Reviewing Data Collected (Web Platform)

5.1 Understanding KoBo Webform Interface

1. Re-open (<http://www.kobotoolbox.org>) the Kobo Toolbox homepage and sign in.
2. Click on the template most recently filled. (e.g. PCRAFI II Templates) (Figure 38) (Note the increase in submissions)

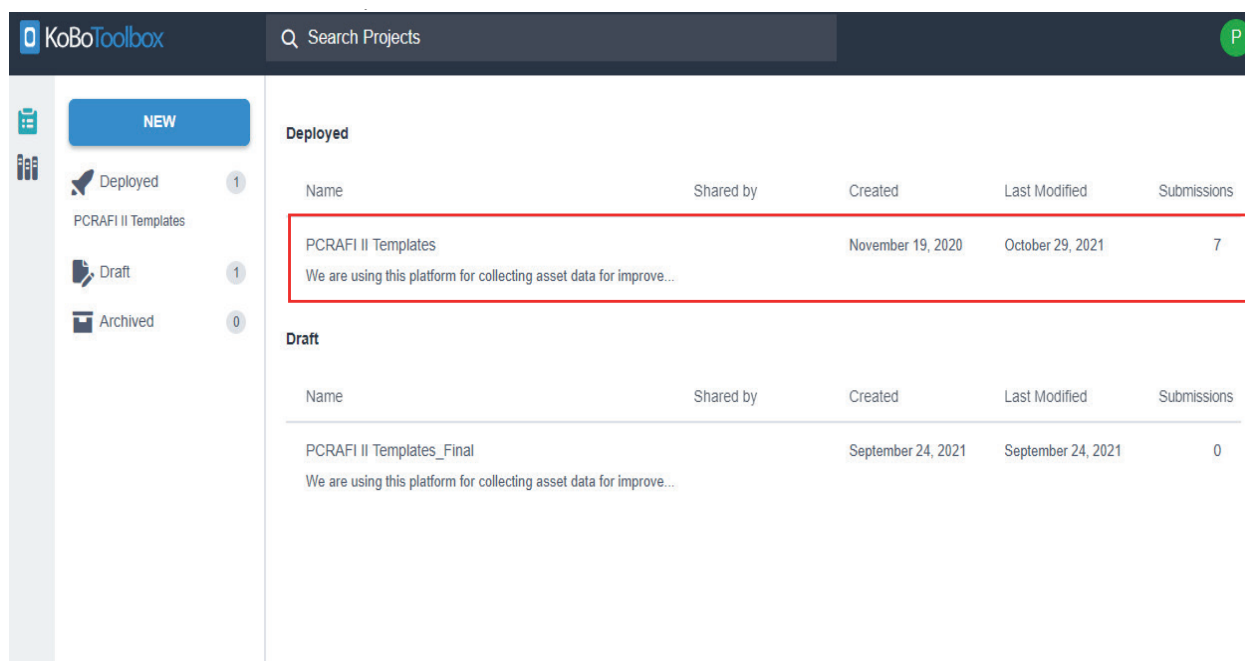


Figure 73: Viewing forms that have been sent back to the server on KoBoToolbox web platform

3. The following interface will appear (Figure 39). Four main tabs will appear on the top of the page:
 - a. Summary – gives a visual display of all the information related to the user's project. Depending on the type of user (project owner/user with restricted permission, etc), different information will be shown to the user.
 - b. Form – includes last modified, last submission, and number of questions
 - c. Data – useful links to information related to submitted data
 - d. Settings – allows the user view/edit settings for the entire project (ie. Name, sharing capabilities, media, etc)
4. Additionally, on the right of the page the user has access to Quick Links, these include:
 - a. Collect data
 - b. Share project
 - c. Edit form
 - d. Preview form

5. Below these are also quick links to the “Data” tab found above. These include:

- Table – allows user to view/edit attribute table of data collected
- Reports – provides an automated report on raw data submitted to the project (will still require data cleaning prior to using graphs/figures, etc)
- Gallery – allows user to view photos that have been recorded/submitted to the project
- Downloads – allows the user to download/export the data collected in different data types (eg. CSV, XLS, GeoJSON, KML, etc)
- Map – allows the user to visualize the coordinates collected for the project on a base map. The user is also able to toggle which GeoPoint question to view, overlay with uploaded data and even edit colour set for disaggregated map markers – this can be done under Map Settings

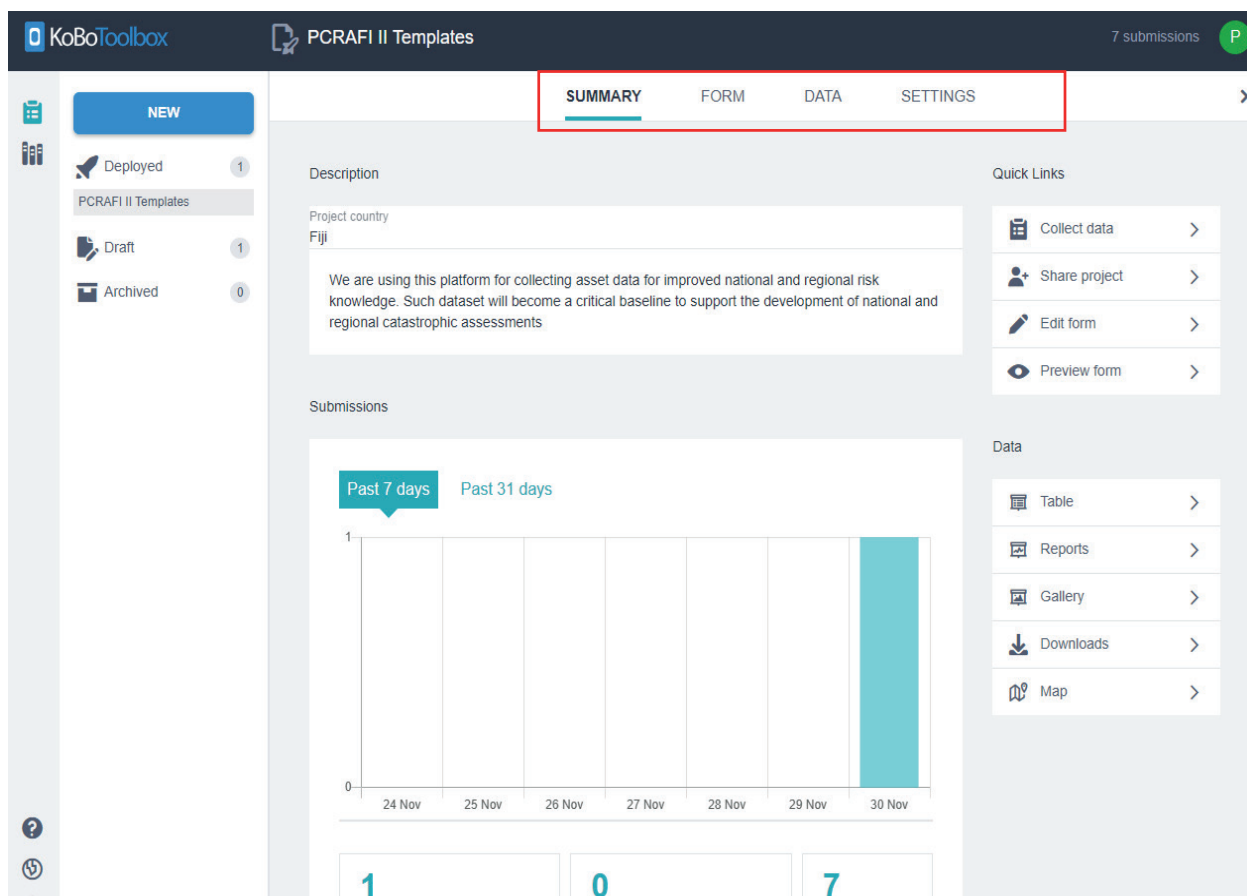


Figure 74: Summary view of the forms uploaded for PCRAFI II Template

5.2 Data Validation

The Validator has to go through each of the submission and check if all the attributes entered meet the required standard i.e., all field filled out correctly or if there's secondary inform that needs to be entered into the form. The following steps outlines the validation process.

- Select “Edit” to view and make changes to the form in web view (refer to Figure 77).
- Check all attributes if all data is correct including GPS Point. Adjust GPS point if not in the correct location. To adjust GPS Point for an asset simply click on the pin, drag, and drop in that in the feature (refer to Figure 78). When moving GPS points for buildings, the points must be adjusted in correlation with the building ID i.e., the building footprint ID & Asset ID.
- Once adjusted the form can be “**approved**” and ready for integration. The same can be repeated for all other attributes. If any data has been incorrectly captured the validator will need to select “**not approved**” or “**on hold**” pending confirmation from the surveyor (refer to Figure 79).

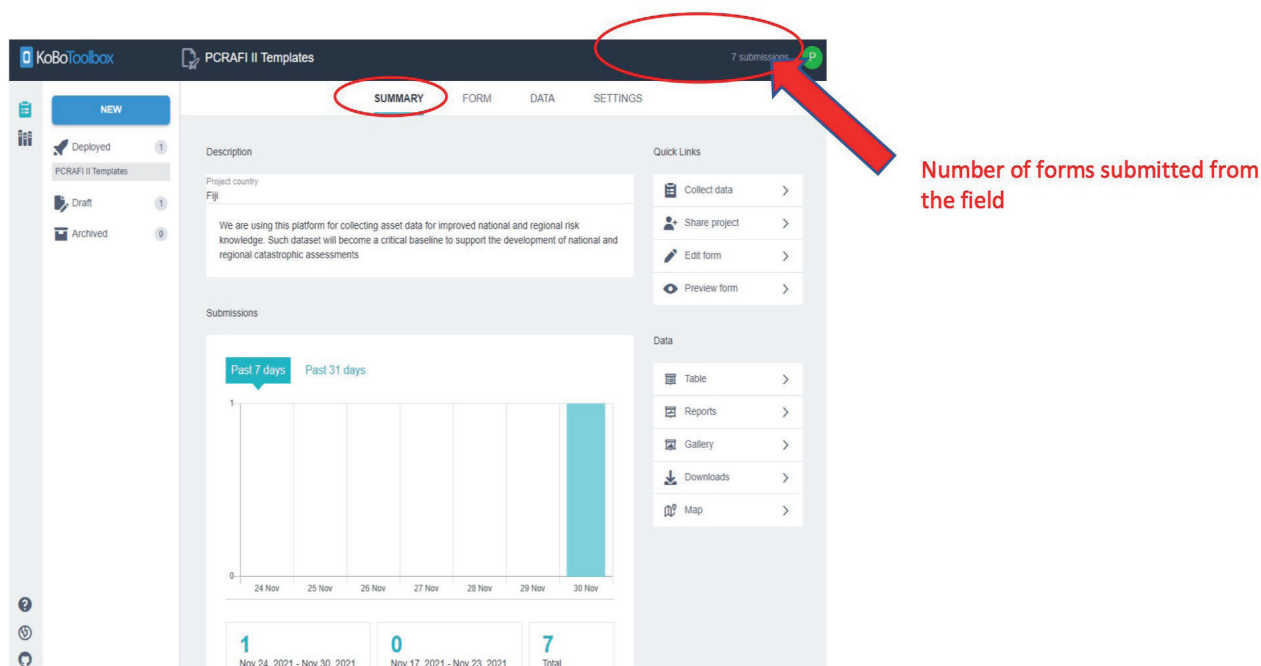


Figure 75: KoBoToolbox - interface of guide showing number of forms submitted

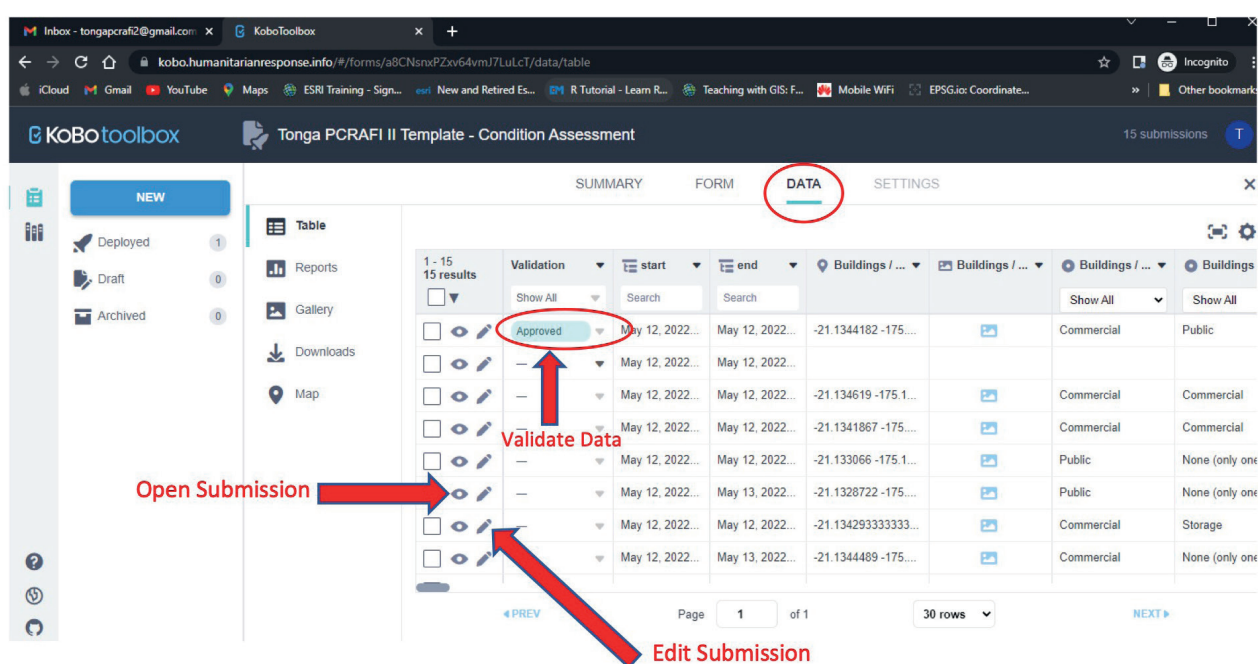


Figure 76: Options where the Validator can open the form to view, edit and approve submissions

The screenshot shows the 'DATA' tab of the KoboToolbox web platform. The table displays 376 results. The first row is highlighted, and a red circle is drawn around the 'Edit' icon (a pencil) in the first column of the table. The table has columns for Validation, start, end, meta / audit, and PLEASE C... (likely 'PLEASE COMMENT'). The 'Edit' icon is located in the first column of the first row.

Figure 77: Click “edit” to view and validate the submitted forms

The figure shows two side-by-side screenshots of the 'Buildings' form. The left screenshot shows the form with a red circle around the 'Collect GPS point' section. The right screenshot shows the form with a red arrow pointing to the 'Collect GPS point' section. The form includes fields for latitude (x,y °), longitude (x,y °), altitude (m), and accuracy (m). It also has a map view showing a building and a search bar for place or address.

Figure 78: Adjusting GPS points

The screenshot shows the 'DATA' tab of the KoboToolbox web platform. The table displays 376 submissions. The first row is highlighted, and a red circle is drawn around the 'Validate Data' button (a checkmark) in the first column of the table. The table has columns for Validation, start, end, meta / audit, and PLEASE C... (likely 'PLEASE COMMENT'). The 'Validate Data' button is located in the first column of the first row.

Figure 79: Validator can approve, put on hold, or not approve the data submitted

6.0 Downloading data and Integrating with QGIS

6.1 Downloading data

1. Click on the “Downloads” tab on the right side of the page OR the “DATA” tab on the top of the page to download/export data. (Figure 80)
2. Once on the “Download” page, select export type and value and header format. “Advanced options” is also available if user would like to select certain templates/questions to download/export and also determine the types of columns the data is to be downloaded/exported in. (Figure 81)
3. Click on the “EXPORT” tab to begin exporting of data. Once exporting is complete, click on the “Download” tab. (Figure 81) Please note that any export stuck in the “Pending” state for longer than an hour will likely never succeed; if you encounter such an export, please feel free to delete it and create a new export.

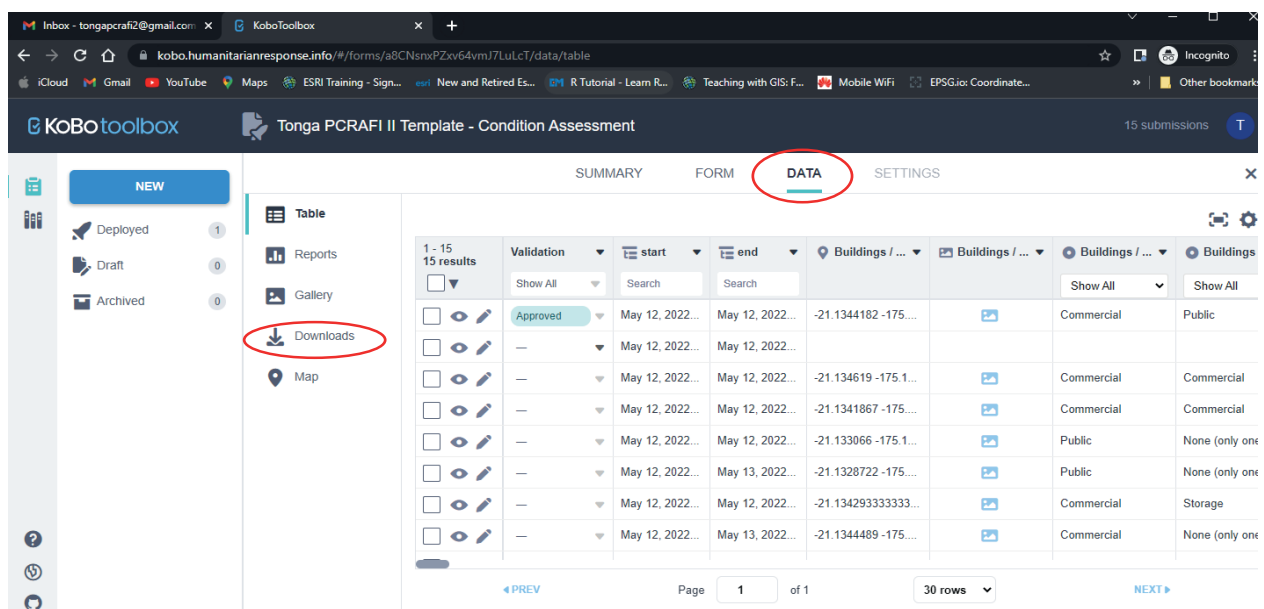


Figure 80: Click in downloads to download the forms

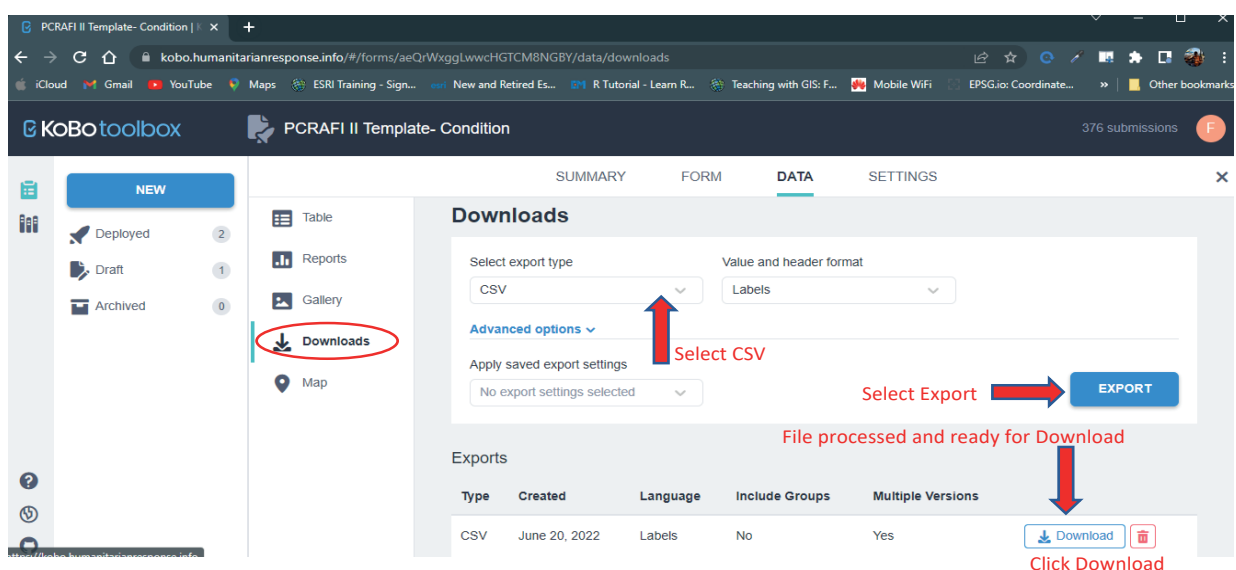


Figure 81: Downloads options to choose from

6.2 Data Processing

The following process outlines the necessary steps taken to clean and organize the downloaded data from KoBoToolbox for projects that has 2 or more forms. If this is the case, the datasets will need to be merged into the original form or the initial deployed form. This process is done using excel (xls) format.

(Note that if the project has one form, it can be loaded directly to any GIS software for data cleaning & organizing)

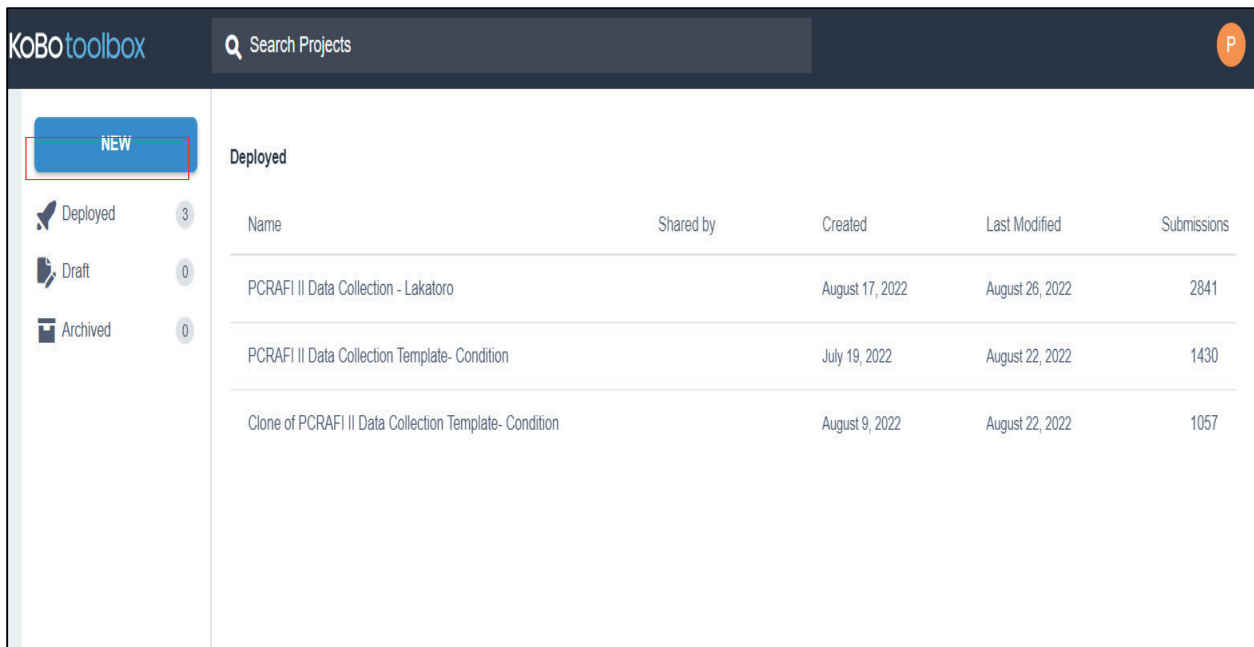


Figure 82: Project having more than one form

- A.** To ensure data is merged correctly each of the form's header will need to be compared against each other to identify any differences between the forms. Copy all the headers from each form and paste 'transpose' on a blank workbook or sheet as shown below.

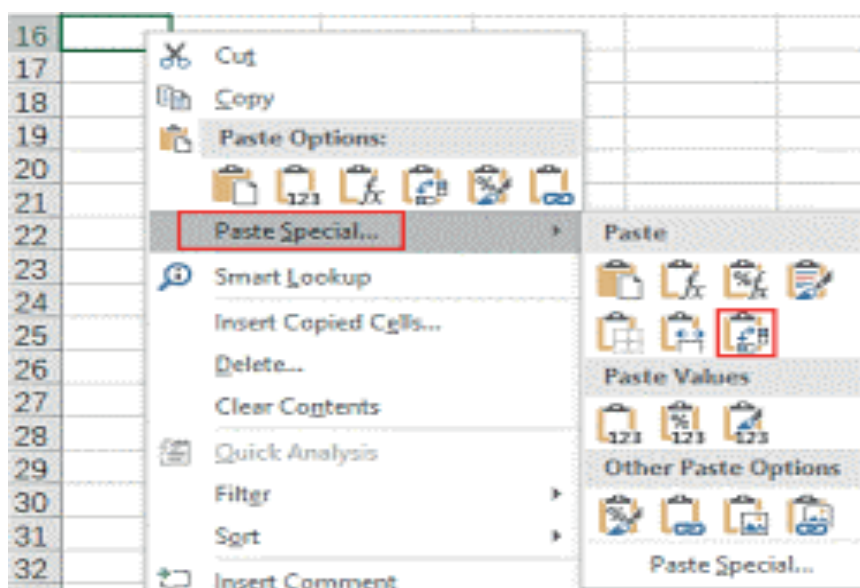


Figure 83: Headers copied and pasted in workbook(excel)

A	B
Clone Headers	Original Form 1
start	start
end	end
today	today
username	username
deviceid	deviceid
phonenumber	phonenumber
audit	audit
audit URL	audit URL
PLEASE CHOOSE SURVEY FORM	PLEASE CHOOSE SURVEY FORM
COUNTRY	COUNTRY
Date and Time	Date and Time
Grid ID	Grid ID
Feature ID	Feature ID
Name/description of the Building	Name/description of the Building
Presence of Building	Presence of Building
Photo of site for verification	Photo of site for verification
Photo of site for verification URL	Photo of site for verification URL
Collect GPS point	Collect GPS point
Collect GPS point latitude	Collect GPS point latitude
Collect GPS point longitude	Collect GPS point longitude
Collect GPS point altitude	Collect GPS point altitude
Collect GPS point precision	Collect GPS point precision
Photo of Building 1	Photo of Building 1
Photo of Building 1 URL	Photo of Building 1 URL
Photo of Building 2	Photo of Building 2
Photo of Building 2 URL	Photo of Building 2 URL
Photo of Building 3	Photo of Building 3
Photo of Building 3 URL	Photo of Building 3 URL
Photo of Building 4	Photo of Building 4
Photo of Building 4 URL	Photo of Building 4 URL
Usage/Occupancy Class	Usage/Occupancy Class
Subuse	Subuse
Foundation Type	Foundation Type
Foundation Bracing	Foundation Bracing
Foundation Condition	Foundation Condition
Min Floor Height above ground	Min Floor Height above ground
Max Floor Height above ground	Max Floor Height above ground
Building Structure	Building Structure
Comment	Comment
Wall Material	Wall Material
Wall Material/Concrete	Wall Material/Concrete
Wall Material/Masonry	Wall Material/Masonry
Wall Material/Metal Sheet	Wall Material/Metal Sheet
Wall Material/Fibre Cement Sheets	Wall Material/Fibre Cement Sheets
Wall Material/Unknown Sheet	Wall Material/Unknown Sheet
Wall Material/Fibre Cement Board	Wall Material/Fibre Cement Board
Wall Material/Timber Board	Wall Material/Timber Board
Wall Material/Unknown board	Wall Material/Unknown board
Wall Material/Traditional Material	Wall Material/Traditional Material

- B. To run a check for both fields, enter "if then else statement" to compare e.g., below in the formula tab. The check will identify different headers and return the text "New" if not the same.

C2			=IF(B2=A2,"Same","New")
	A	B	C
1	Clone Headers	Original Form 1	Check
2	start	start	Same
3	end	end	Same
4	today	today	Same
5	username	username	Same
6	deviceid	deviceid	Same
7	phonenumber	phonenumber	Same
8	audit	audit	Same
9	audit URL	audit URL	Same
10	PLEASE CHOOSE SURVEY FORM	PLEASE CHOOSE SURVEY FORM	Same
11	COUNTRY	COUNTRY	Same
12	Date and Time	Date and Time	Same
13	Grid ID	Grid ID	Same
14	Feature ID	Feature ID	Same
15	Name/description of the Building	Name/description of the Building	Same
16	Presence of Building	Presence of Building	Same
17	Photo of site for verification	Photo of site for verification	Same
18	Photo of site for verification URL	Photo of site for verification URL	Same
19	Collect GPS point	Collect GPS point	Same
20	Collect GPS point latitude	Collect GPS point latitude	Same
21	Collect GPS point longitude	Collect GPS point longitude	Same
22	Collect GPS point altitude	Collect GPS point altitude	Same
23	Collect GPS point precision	Collect GPS point precision	Same
24	Photo of Building 1	Photo of Building 1	Same
25	Photo of Building 1 URL	Photo of Building 1 URL	Same
26	Photo of Building 2	Photo of Building 2	Same
27	Photo of Building 2 URL	Photo of Building 2 URL	Same
28	Photo of Building 3	Photo of Building 3	Same
29	Photo of Building 3 URL	Photo of Building 3 URL	Same
30	Photo of Building 4	Photo of Building 4	Same
31	Photo of Building 4 URL	Photo of Building 4 URL	Same
32	Usage/Occupancy Class	Usage/Occupancy Class	Same
33	Subuse	Subuse	Same
34	Foundation Type	Foundation Type	Same
35	Foundation Bracing	Foundation Bracing	Same
36	Foundation Condition	Foundation Condition	Same
37	Min Floor Height above ground	Min Floor Height above ground	Same
38	Max Floor Height above ground	Max Floor Height above ground	Same
39	Building Structure	Building Structure	Same
40	Comment	Comment	Same
41	Wall Material	Wall Material	Same
42	Wall Material/Concrete	Wall Material/Concrete	Same
43	Wall Material/Masonry	Wall Material/Masonry	Same
44	Wall Material/Metal Sheet	Wall Material/Metal Sheet	Same
45	Wall Material/Fibre Cement Sheets	Wall Material/Fibre Cement Sheets	Same
46	Wall Material/Unknown Sheet	Wall Material/Unknown Sheet	Same
47	Wall Material/Fibre Cement Board	Wall Material/Fibre Cement Board	Same
48	Wall Material/Timber Board	Wall Material/Timber Board	Same
49	Wall Material/Unknown board	Wall Material/Unknown board	Same
50	Wall Material/Traditional Material	Wall Material/Traditional Material	Same
51	Wall Material/Tarpaulin or other flexible sheet material		New
52	Wall Material/Other	Wall Material/Other	Same
53	Wall Material/None (No walls)	Wall Material/None (No walls)	Same
54	Wall Condition	Wall Condition	Same
55	Window Type	Window Type	Same

Figure 84: Expression return output as either "New" or "Same" as shown in the third column

- C. The additional fields that were created for clone 2 will need to be inserted and copied on to the original form or 1st form. As shown below the clone form had 5 new fields when compared to the first form. These 5 new fields will need to be copied back to the original form to merge the clone data to the first form

C2			
=IF(B2=A2,"Same","New")			
	A	B	C
1	Clone Headers	Original Form 1	Check
35	Foundation Bracing	Foundation Bracing	Same
36	Foundation Condition	Foundation Condition	Same
37	Min Floor Height above ground	Min Floor Height above ground	Same
38	Max Floor Height above ground	Max Floor Height above ground	Same
39	Building Structure	Building Structure	Same
40	Comment	Comment	Same
41	Wall Material	Wall Material	Same
42	Wall Material/Concrete	Wall Material/Concrete	Same
43	Wall Material/Masonry	Wall Material/Masonry	Same
44	Wall Material/Metal Sheet	Wall Material/Metal Sheet	Same
45	Wall Material/Fibre Cement Sheets	Wall Material/Fibre Cement Sheets	Same
46	Wall Material/Unknown Sheet	Wall Material/Unknown Sheet	Same
47	Wall Material/Fibre Cement Board	Wall Material/Fibre Cement Board	Same
48	Wall Material/Timber Board	Wall Material/Timber Board	Same
49	Wall Material/Unknown board	Wall Material/Unknown board	Same
50	Wall Material/Traditional Material	Wall Material/Traditional Material	Same
51	Wall Material/Tarpaulin or other flexible sheet material		New
52	Wall Material/Other	Wall Material/Other	Same
53	Wall Material/None (No walls)	Wall Material/None (No walls)	Same
54	Wall Condition	Wall Condition	Same
55	Window Type	Window Type	Same
56	Window Type/Awning windows	Window Type/Awning windows	Same
57	Window Type/Louvers	Window Type/Louvers	Same
58	Window Type/Bay/Rectangle Windows	Window Type/Bay/Rectangle Windows	Same
59	Window Type/Bow (outward projected) Windows	Window Type/Bow (outward projected) Win	Same
60	Window Type/Open windows / no glass (may have fly wire covering)		New
61	Window Type/Others	Window Type/Others	Same
62	Window Type/None	Window Type/Open windows / no glass (ma	New
63	Description of 'other' window type	Description of 'other' window type	Same
64	Photo of 'other' window type	Photo of 'other' window type	Same
65	Photo of 'other' window type URL	Photo of 'other' window type URL	Same
66	Window Protection	Window Protection	Same
67	Roof Shape	Roof Shape	Same
68	Comment 1	Comment 1	Same
69	Roof Material	Roof Material	Same
70	Roof Pitch	Roof Pitch	Same
71	Comment 2	Comment 2	Same
72	Roof Condition	Roof Condition	Same
73	Building Year	Building Year	Same
74	Number of levels / storeys		New
75	Number of Storeys	Number of Storeys	Same
76	Under Storey level	Under Storey level	Same
77	Utilities	Utilities	Same
78	Utilities/Water	Utilities/Water	Same
79	Utilities/Electricity	Utilities/Electricity	Same
80	Utilities/Telecommunication	Utilities/Telecommunication	Same
81	Utilities/Electricity - Solar	Utilities/Electricity - Solar	Same
82	Utilities/Water Tank	Utilities/Water Tank	Same
83	Utilities/Generator	Utilities/Generator	Same

Figure 85: Five new fields returned highlighted in yellow

After sorting the 2nd form with the 1st form, then repeat the same to the 3rd form with the 1st form. Any new fields or changes to the order of the attributes will need to be adjusted and included in the first form as shown below.

	A	B	C	D	E	F	G	H	I
1	Form 1	Clone 2	Check	Lakatoro Form	LK_Check	Lakatoro_Sorted			
2	start	start	Same	start	Same	start			
3	end	end	Same	end	Same	end			
4	today	today	Same	today	Same	today			
5	username	username	Same	username	Same	username			
6	deviceid	deviceid	Same	deviceid	Same	deviceid			
7	phonenumber	phonenumber	Same	phonenumber	Same	phonenumber			
8	audit	audit	Same	audit	Same	audit			
9	audit_URL	audit_URL	Same	audit_URL	Same	audit_URL			
10	PLEASE CHOOSE SURVEY FORM	PLEASE CHOOSE SURVEY FORM	Same	PLEASE CHOOSE SURVEY FORM	Same	PLEASE CHOOSE SURVEY FORM			
11	COUNTRY	COUNTRY	Same	COUNTRY	Same	COUNTRY			
12	Date and Time	Date and Time	Same	Date and Time	Same	Date and Time			
13	Grid ID	Grid ID	Same	Grid ID	Same	Grid ID			
14	Feature ID	Feature ID	Same	Feature ID	Same	Feature ID			
15	Name/ description of the Building	Name/ description of the Building	Same	Name/ description of the Building	Same	Name/ description of the Building			
16	Presence of Building	Presence of Building	Same	Presence of Building	Same	Presence of Building			
17	Photo of site for verification	Photo of site for verification	Same	Photo of site for verification	Same	Photo of site for verification			
18	Photo of site for verification_URL	Photo of site for verification_URL	Same	Photo of site for verification_URL	Same	Photo of site for verification_URL			
19	Collect GPS point	Collect GPS point	Same	Collect GPS point	Same	Collect GPS point			
20	_Collect GPS point_latitude	_Collect GPS point_latitude	Same	_Collect GPS point_latitude	Same	_Collect GPS point_latitude			
21	_Collect GPS point_longitude	_Collect GPS point_longitude	Same	_Collect GPS point_longitude	Same	_Collect GPS point_longitude			
22	_Collect GPS point_altitude	_Collect GPS point_altitude	Same	_Collect GPS point_altitude	Same	_Collect GPS point_altitude			
23	_Collect GPS point_precision	_Collect GPS point_precision	Same	_Collect GPS point_precision	Same	_Collect GPS point_precision			
24	Photo of Building 1	Photo of Building 1	Same	Collect GPS point_1	Same	Photo of Building 1			
25	Photo of Building 1_URL	Photo of Building 1_URL	Same	_Collect GPS point_latitude_1	Same	Photo of Building 1_URL			
26	Photo of Building 2	Photo of Building 2	Same	_Collect GPS point_longitude_1	Same	Photo of Building 2			
27	Photo of Building 2_URL	Photo of Building 2_URL	Same	_Collect GPS point_altitude_1	Same	Photo of Building 2_URL			
28	Photo of Building 3	Photo of Building 3	Same	_Collect GPS point_precision_1	Same	Photo of Building 3			
29	Photo of Building 3_URL	Photo of Building 3_URL	Same	Photo of Building 1	Same	Photo of Building 3_URL			
30	Photo of Building 4	Photo of Building 4	Same	Photo of Building 1_URL	Same	Photo of Building 4			
31	Photo of Building 4_URL	Photo of Building 4_URL	Same	Photo of Building 2	Same	Photo of Building 4_URL			
32	Usage/Occupancy Class	Usage/Occupancy Class	Same	Photo of Building 2_URL	Same	Usage/Occupancy Class			
33	Subuse	Subuse	Same	Photo of Building 3	Same	Subuse			
34	Foundation Type	Foundation Type	Same	Photo of Building 3_URL	Same	Foundation Type			
35	Foundation Bracing	Foundation Bracing	Same	Photo of Building 4	Same	Foundation Bracing			
36	Foundation Condition	Foundation Condition	Same	Photo of Building 4_URL	Same	Foundation Condition			
37	Min Floor Height above ground	Min Floor Height above ground	Same	Usage/Occupancy Class	Same	Min Floor Height above ground			
38	Max Floor Height above ground	Max Floor Height above ground	Same	Subuse	Same	Max Floor Height above ground			
39	Building Structure	Building Structure	Same	Foundation Type	Same	Building Structure			
40	Comment	Comment	Same	Foundation Bracing	Same	Comment			
41	Vall Material	Vall Material	Same	Foundation Condition	Same	Vall Material			
42	Vall Material/Concrete	Vall Material/Concrete	Same	Min Floor Height above ground	Same	Vall Material/Concrete			
43	Vall Material/Masonry	Vall Material/Masonry	Same	Max Floor Height above ground	Same	Vall Material/Masonry			
44	Vall Material/Metal Sheet	Vall Material/Metal Sheet	Same	Building Structure	Same	Vall Material/Metal Sheet			
45	Vall Material/Fibre Cement Sheets	Vall Material/Fibre Cement Sheets	Same	Comment	Same	Vall Material/Fibre Cement Sheets			
46	Vall Material/Unknown Sheet	Vall Material/Unknown Sheet	Same	Vall Material	Same	Vall Material/Unknown Sheet			
47	Vall Material/Fibre Cement Board	Vall Material/Fibre Cement Board	Same	Vall Material/Concrete	Same	Vall Material/Fibre Cement Board			
48	Vall Material/Timber Board	Vall Material/Timber Board	Same	Vall Material/Masonry	Same	Vall Material/Timber Board			
49	Vall Material/Unknown board	Vall Material/Unknown board	Same	Vall Material/Metal Sheet	Same	Vall Material/Unknown board			
50	Vall Material/Traditional Material	Vall Material/Traditional Material	Same	Vall Material/Fibre Cement Sheets	Same	Vall Material/Traditional Material			
51	Vall Material/Tarpaulin or other flexible sheet material	Vall Material/Tarpaulin or other flexible sheet material	Same	Vall Material/Unknown Sheet	Same	Vall Material/Tarpaulin or other flexible sheet material			
52	Vall Material/Other	Vall Material/Other	Same	Vall Material/Fibre Cement Board	Same	Vall Material/Other			
53	Vall Material/None (No walls)	Vall Material/None (No walls)	Same	Vall Material/Timber Board	Same	Vall Material/None (No walls)			
54	Vall Condition	Vall Condition	Same	Vall Material/Unknown board	Same	Vall Condition			
55	Window Type	Window Type	Same	Vall Material/Traditional Material	Same	Window Type			
56	Window Type/Awning windows	Window Type/Awning windows	Same	Vall Material/Tarpaulin or other flexible sheet material	Same	Window Type/Awning windows			
57	Window Type/Louvers	Window Type/Louvers	Same	Vall Material/Other	Same	Window Type/Louvers			
58	Window Type/Bay/Rectangle Windows	Window Type/Bay/Rectangle Windows	Same	Vall Material/None (No walls)	Same	Window Type/Bay/Rectangle Windows			
59	Window Type/Bow (outward projected) Windows	Window Type/Bow (outward projected) Windows	Same	Vall Condition	Same	Window Type/Bow (outward projected) Windows			
60	Window Type/Open windows / no glass (may have fly wire)	Window Type/Open windows / no glass (may have fly wire)	Same	Window Type	Same	Window Type/Open windows / no glass (may have fly wire)			
61	Window Type/Other	Window Type/Other	Same	Window Type/Unknown window	Same	Window Type/Other			

Figure 86: New field captured in the first form

Once the data is merged then insert 3 columns after the Feature ID field. If the project has only one form, then no need to go through the previous steps of merging forms. Label the 3 columns as

- a. "Duplicate Check" - use count if function, select the whole column for range and select the feature id value for criteria

	M	N	O	P	Q
ID	Feature	Duplicate Ch	Length	Char Ch	Validate
2	606	8	3	6	Yes
3	8026	4	4	6	Yes
4	44240	5	5	0	Yes

- b. "Length Check" - to check the length of the id. The maximum length of the feature or buildings ids was 5 digits so anything above 5 could be a potential data entry error

	M	N	O	P	Q
ID	Feature	Duplicate Ch	Length	Char Ch	Validate
2	606	8	3	6	Yes
3	8026	4	4	6	Yes
4	44240	5	5	0	Yes

- c. "Character Check" - checks the feature id last character. Identifying those building id that has been allocated to more than one building and using alphabets to separate them

	M	N	O	P	Q
ID	Feature	Duplicate Ch	Length	Char Ch	Validate
2	606	8	3	6	Yes
3	8026	1	4	6	Yes
4	44240	1	5	0	Yes

Once the formulas have been created on the first row then it will need to be copied or drag down to the last row of the dataset for all three columns.

When completed the final validation will be done after going through the three columns:

- i. Removing Duplicates
- ii. Checking the feature id character lengths
- iii. Splitting/ Digitizing new building footprints and assigning new Id's to those Id's ending with an alphabet character

Note that the excel files (xls) have to be saved as csv files in order to be loaded in QGIS or Arc Map/Pro.

6.3 Data Integration

KoBo Toolbox has several file formats options that data collected can be downloaded and analyse in different software according to the user need. The following steps shows how data downloaded in CSV file can be imported into QGIS for further data processing.

i. Open QGIS & Add Delimited Text Layer

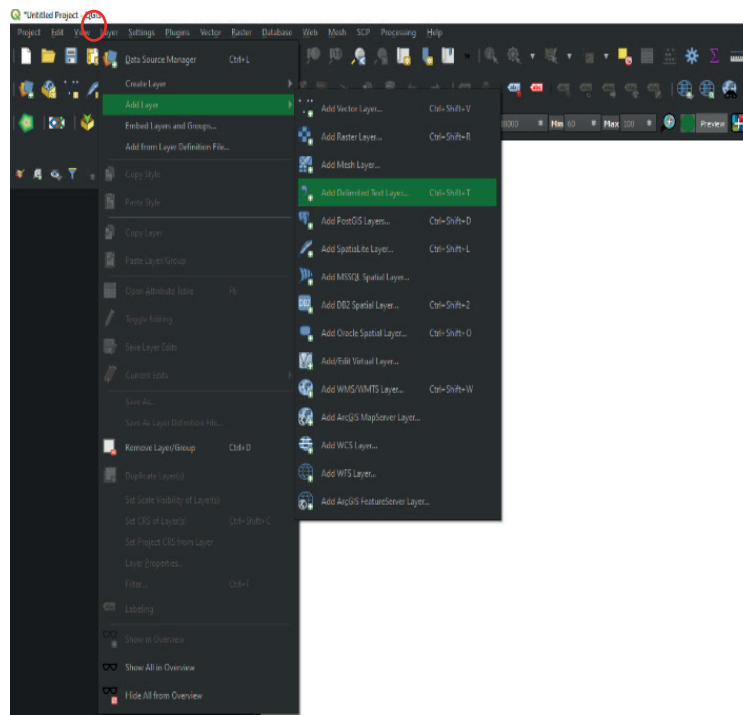


Figure 88: To import layer into QGIS click layer then add delimited text layer

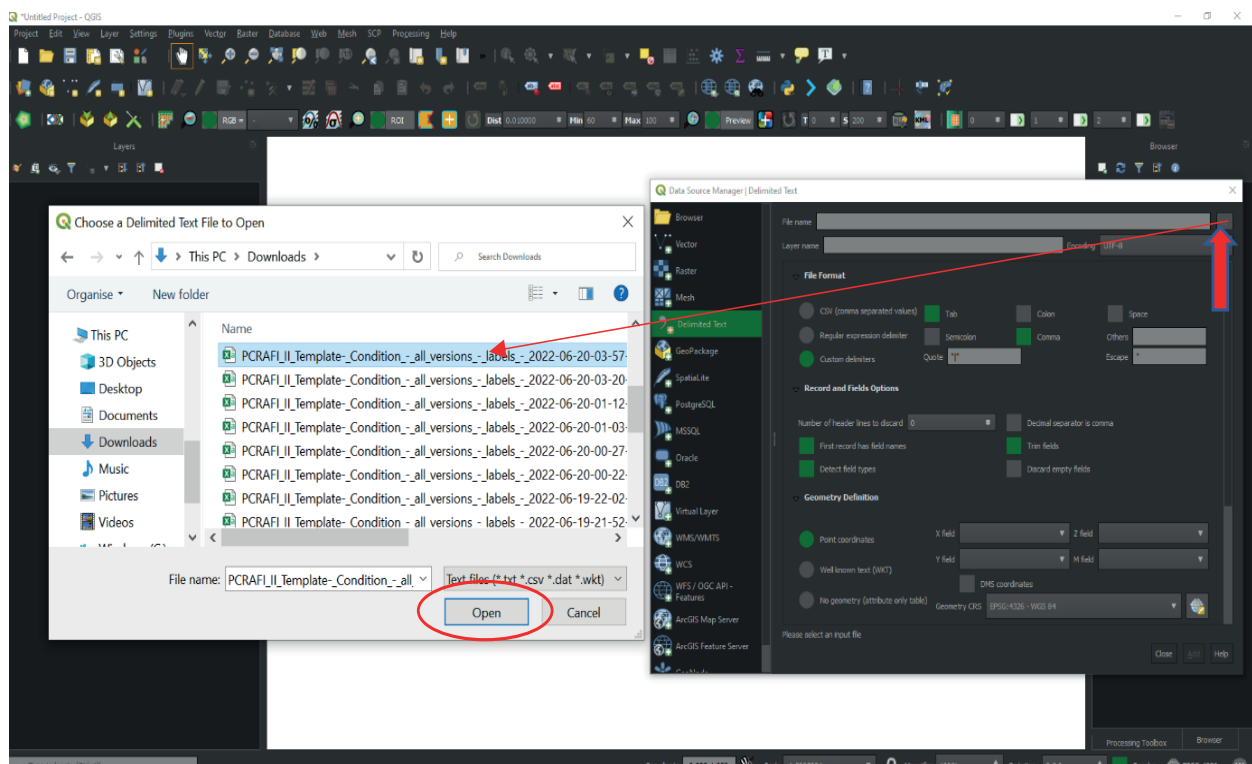
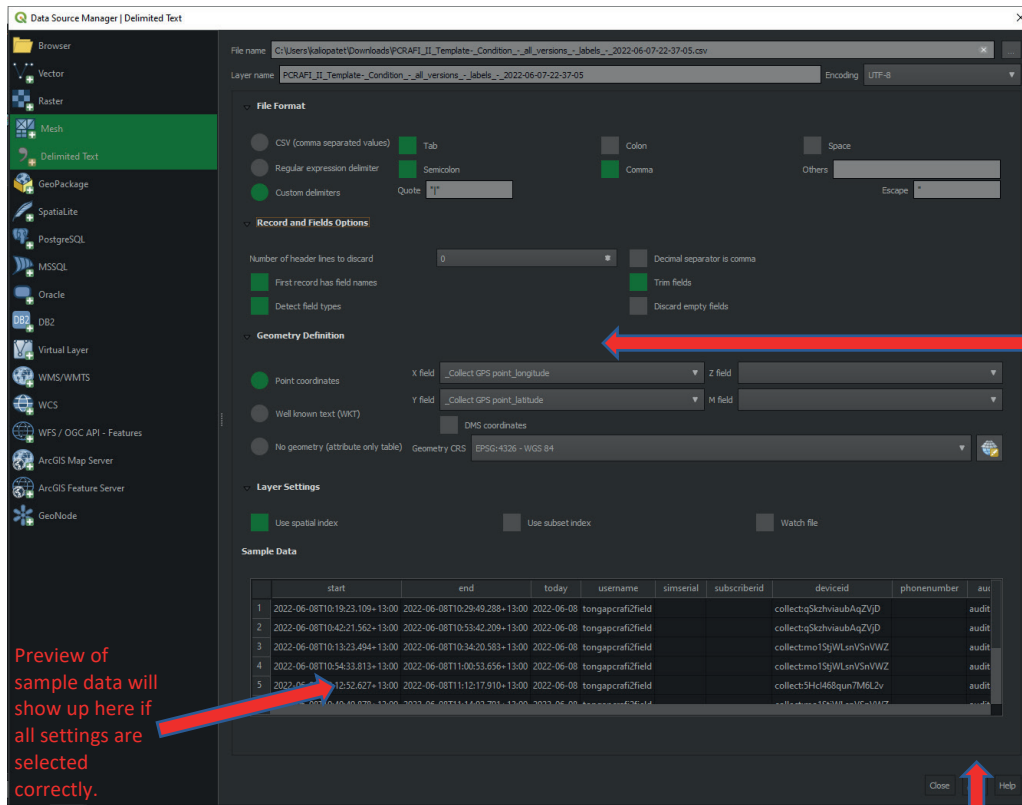


Figure 89: Select and open the data file

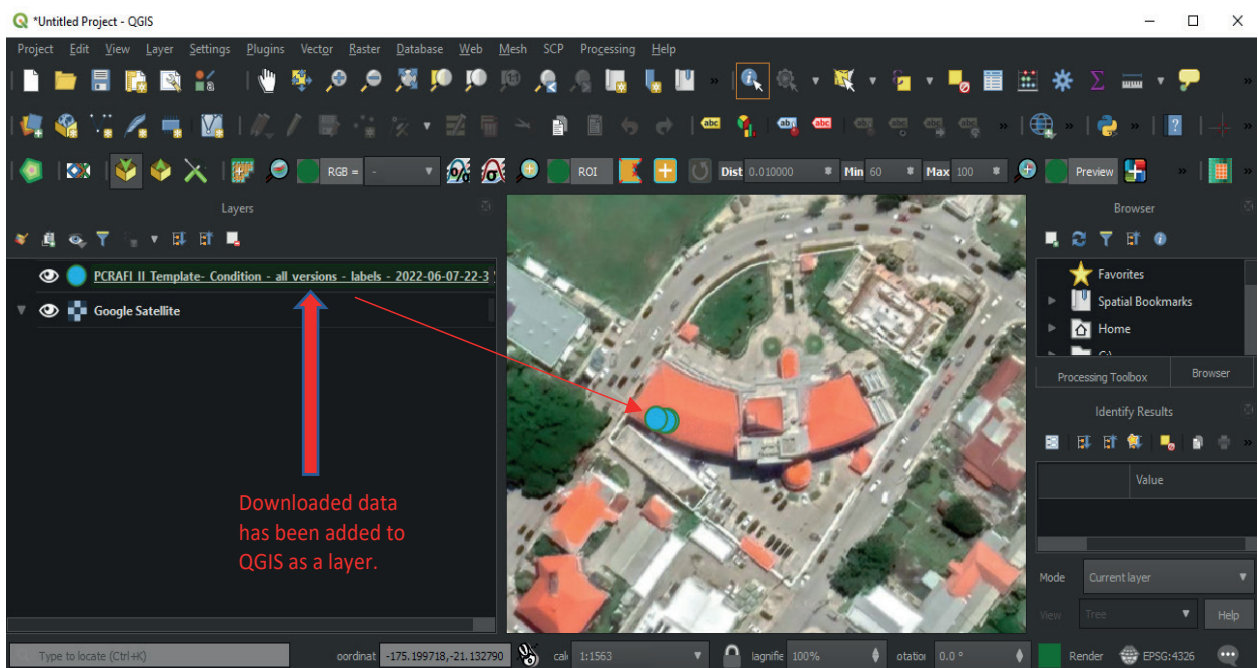
ii. Ensure the below options are selected to display data



X and Y field are pointing to the lon and lat field within the downloaded data.

Click "add" to add layer in to QGIS

iii. Once the layer has been added to QGIS, it can now be exported into a shapefile for further processing.



6.4 Data Validation on QGIS (GPS)

Due to low accuracy when collecting GPS points using mobile apps, sometimes the point will not be in the exact position of a particular feature. That is why this may have to be corrected manually in QGIS or other GIS software (this can also be done in KoBo Toolbox when validating through the map viewer). For those attributes that require a more precise validation and adjustment, QGIS provides the flexibility and functions to validate the collected data. For example, for building data the collected GPS points will need to be moved within the building footprint polygon

- i. The first step requires the GPS points to be labelled using the value "Feature ID". The points will be overlaid with a basemap and Building Footprint Polygon
- ii. Second is enable toggle editing for the building layer to move a point to its matching building footprint using label "Feature ID" as a reference unique ID
- iii. On "Edit" tab select Move Feature(s) then click on the point to move and drop it within the building footprint.
- iv. After adjusting position of the point then save the changes
- v. The same process will be repeated for all points that are not located within the building footprint.

The following pictures below is an example of a building point labelled 14877 which has been moved from within building footprint id 14887.

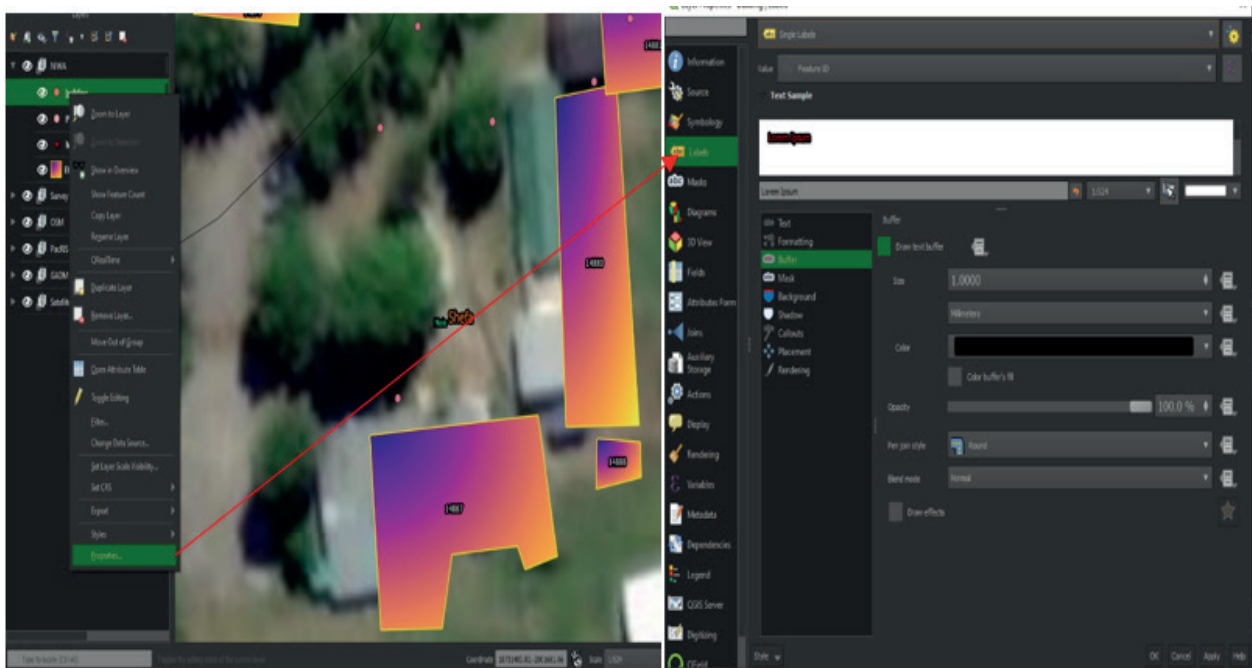


Figure 90: Label GPS point using Feature ID value

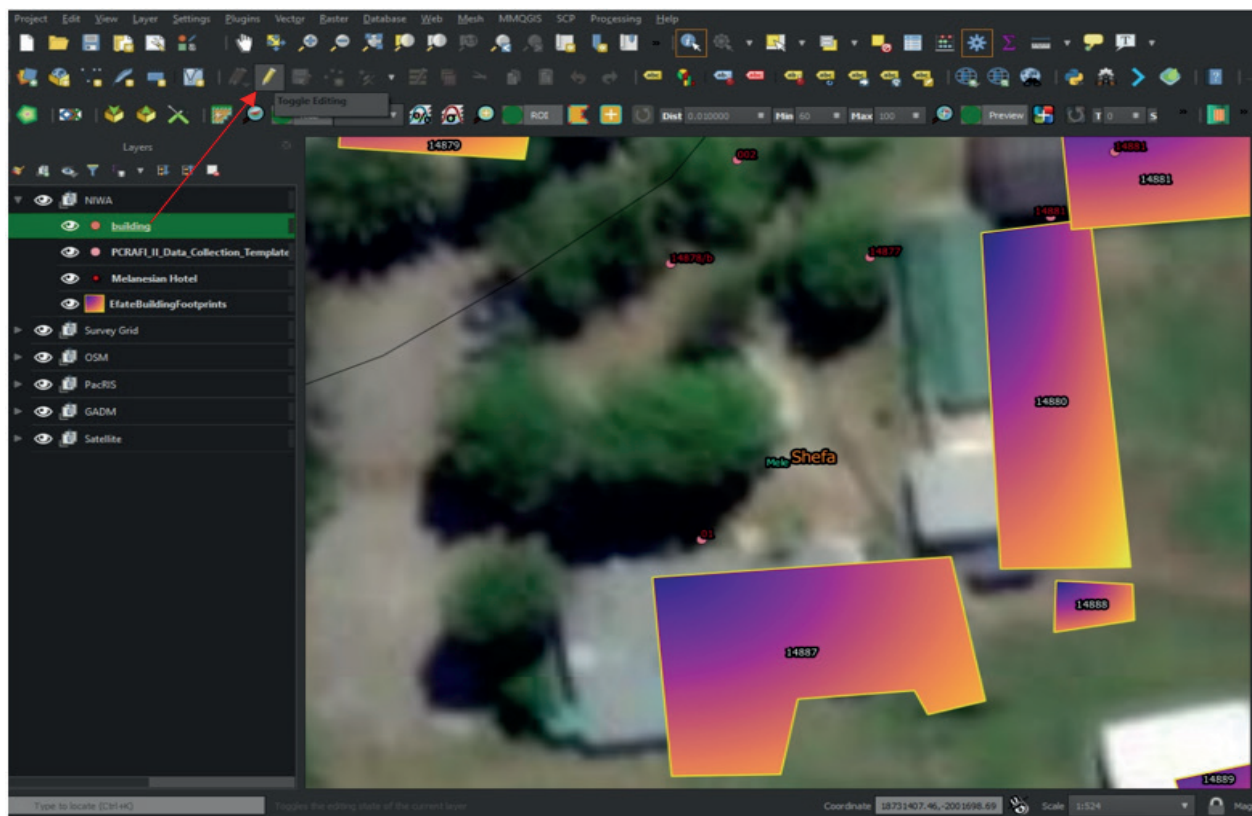


Figure 91: Toggle editing for building layer to move the feature/point

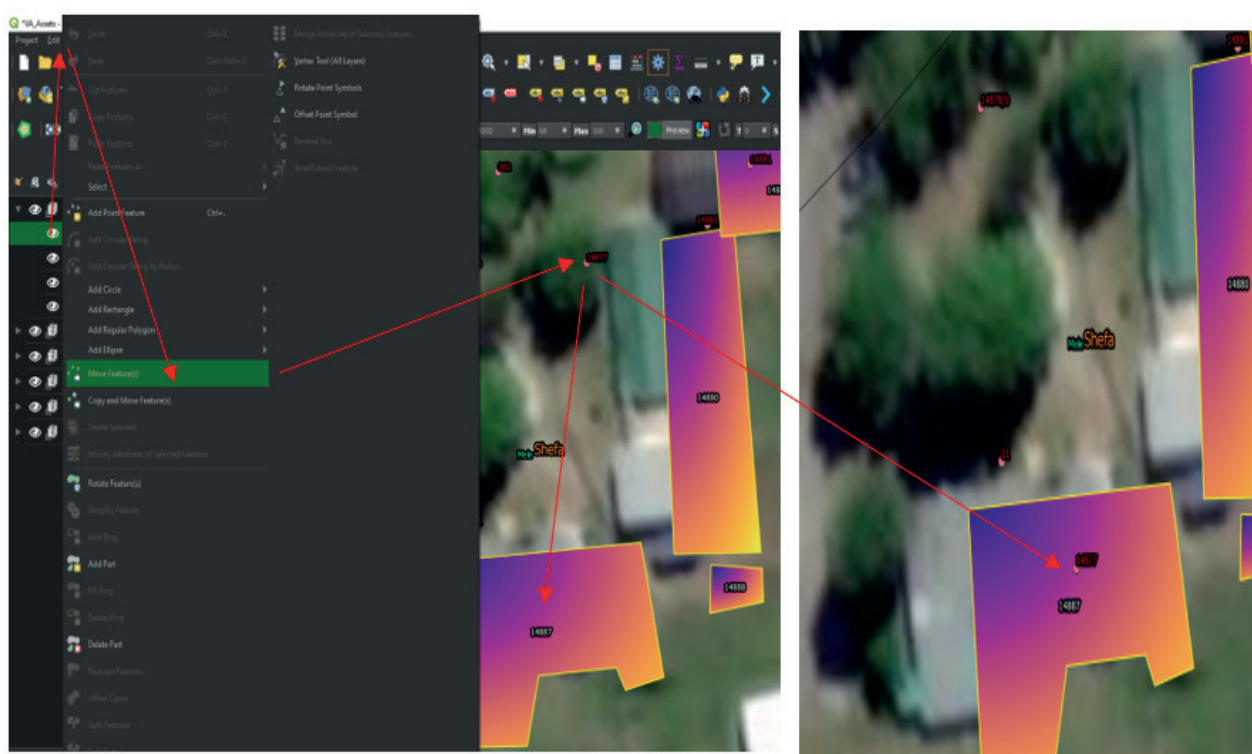
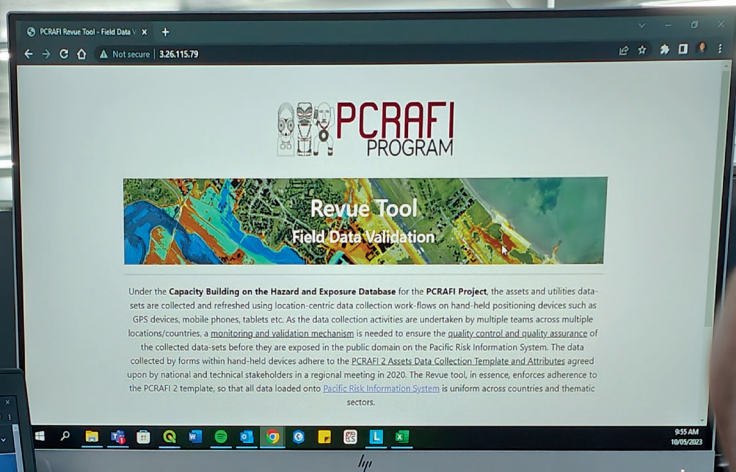


Figure 92: Moving the GPS point into the correct building footprint

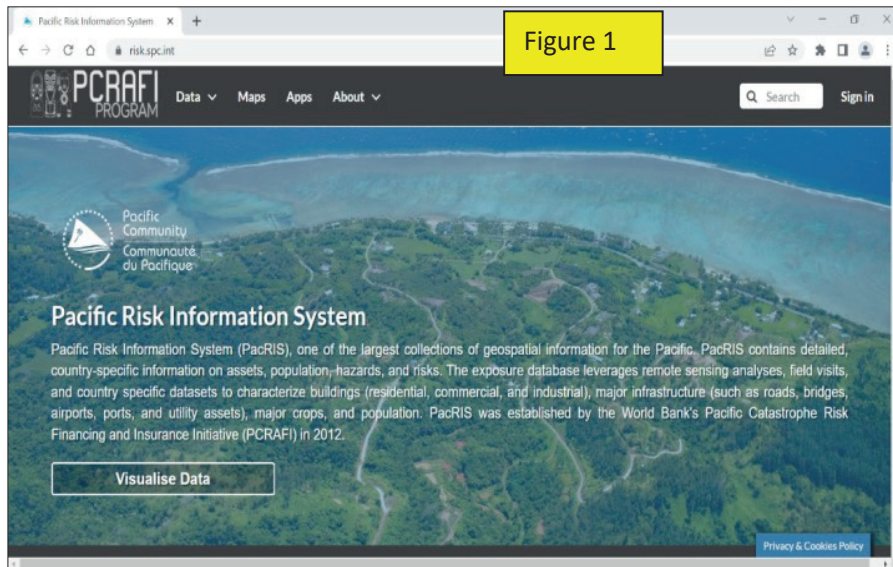


PART II

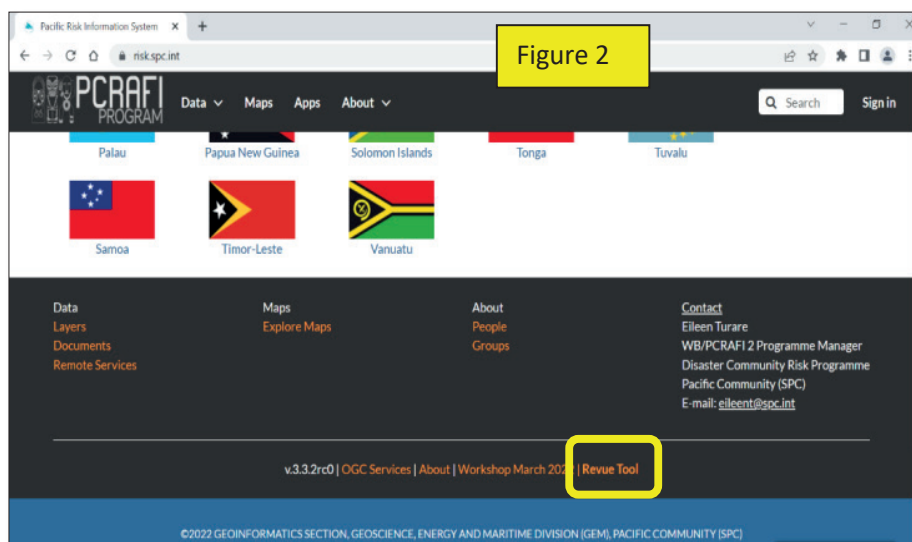
REVUE TOOL

- A. 7.0** How to use the Revue Tool
- B. 8.0** Flow Diagram of a Summary of the Revue Process

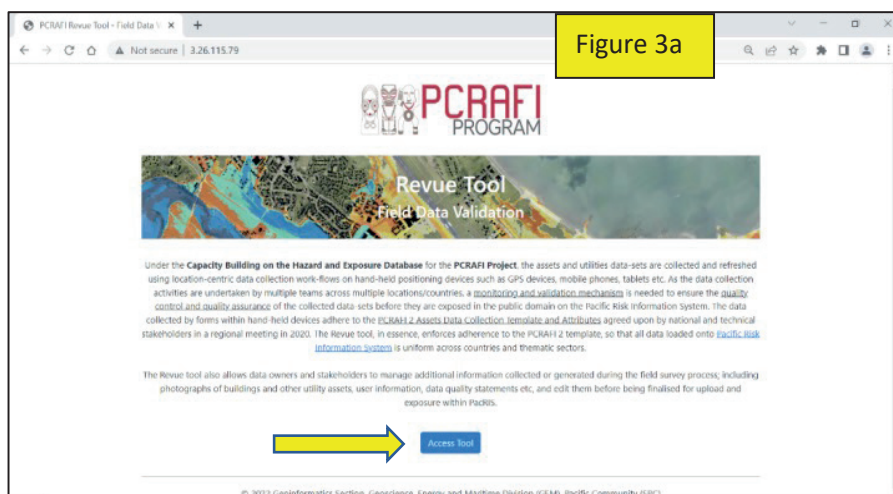
7.0 How to use the Revue Tool



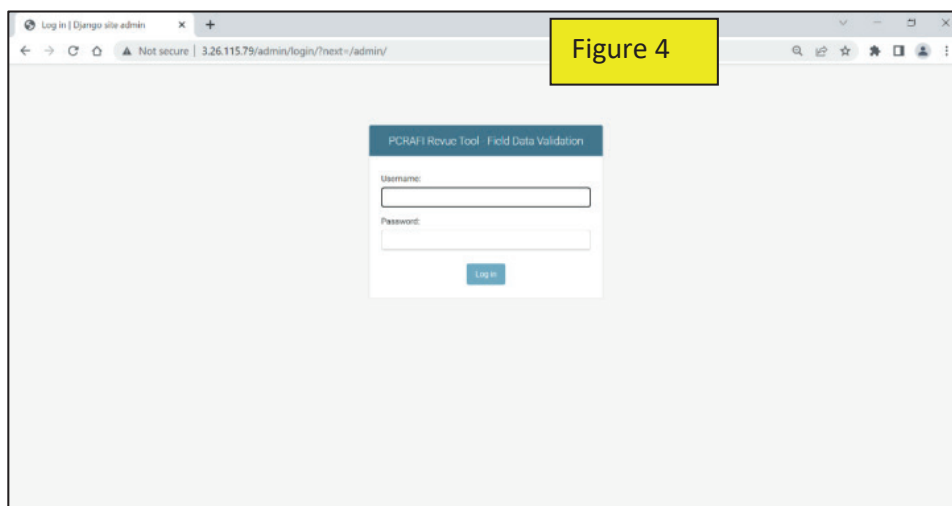
1. Type “pacris” into google and click on the option with the title “Pacific Risk Information System”. You should land at this page shown here in Figure 1.



2. Scroll to the bottom of the PacRIS home page and click on the Revue Tool Option as shown here in the yellow rectangle in Figure 2.



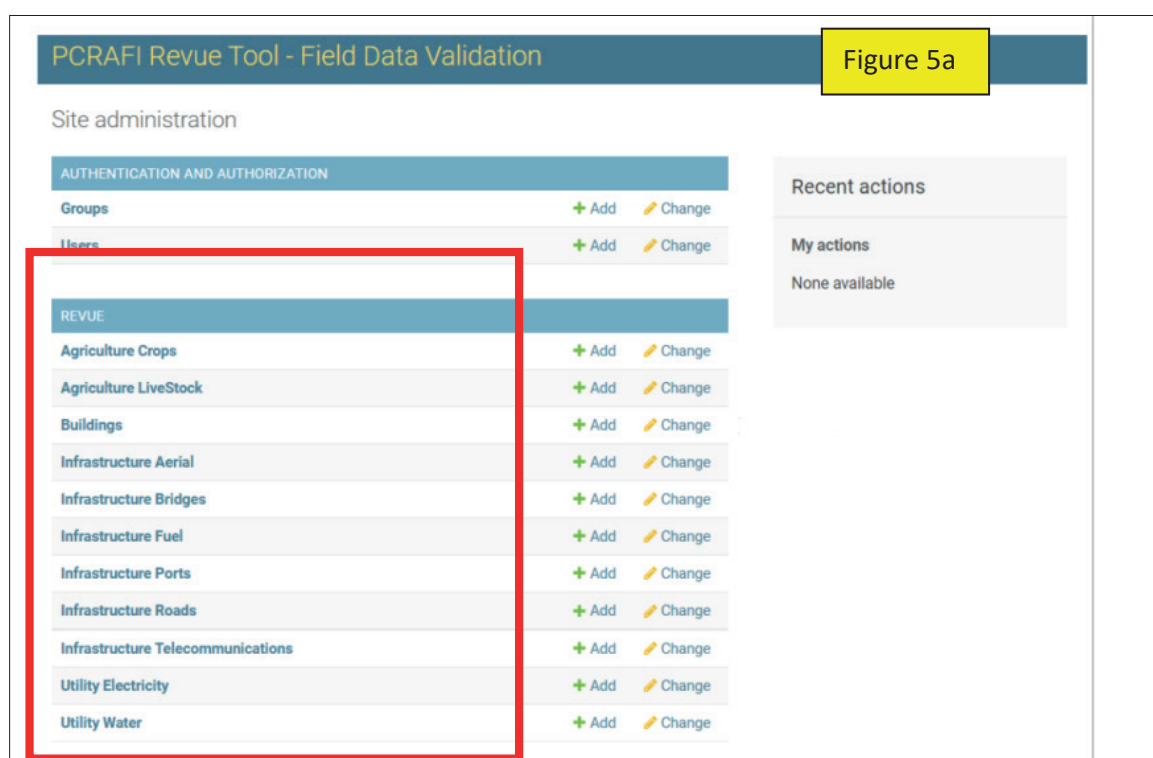
3. Once on the Revue Tool page click on the Access Tool tab (Figure 3a) that will take you to the Login page as shown in Figure 4 below.

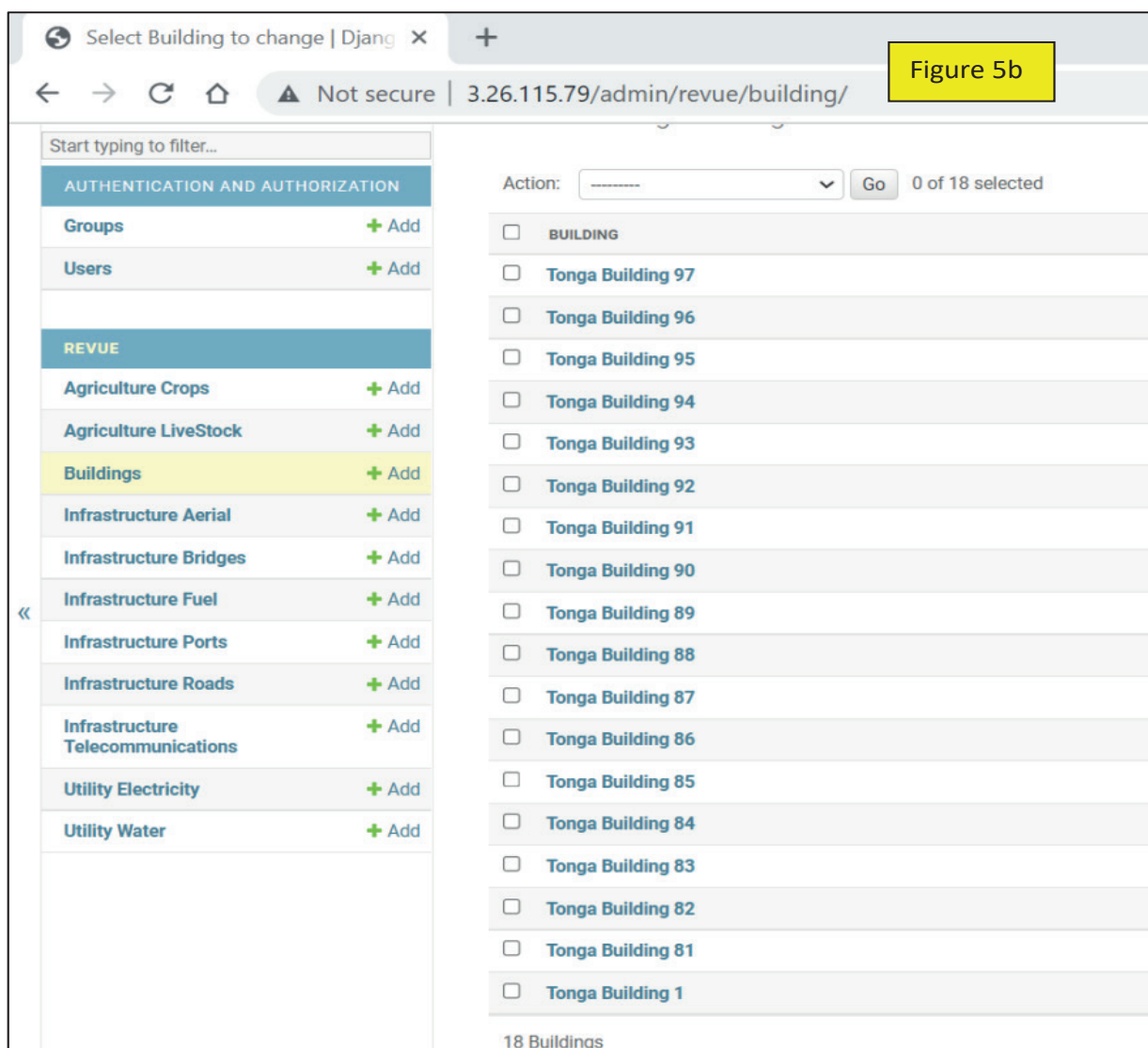


4. Login details will be sent to Field Survey Team Leaders or National Coordinators who will be responsible for the validation of the field data collected.

5. At this stage, all the data collected from the field and into the Kobo server will have already been uploaded into the Revue tool by SPC staff from the back end. By the time Field Survey Team Leaders get to the window below as shown in **Figure 5a**, all they would need to do is click on the relevant heading as indicated under the Revue Menu (and in the red rectangle) to go in and verify the data by clicking on the Change option of the particular building or asset ID from the uploaded data list. .

Figure 5b shows an example where field test data for Tonga has already been uploaded in Revue for building data collected.





6. To validate the data collected for a particular building or asset attribute, the Field Surveyor Team Leader, will need to go through to ensure the location is correct in the map (**Figure 6a**) as well as verify the information for the building (or asset attributes) is correct as shown by the fields in Figure 6b. The fields in Revue are the same as those from the data collection template. Figure 6b also shows where in Revue (in the purple box) can the photos for the asset can be viewed in order to assist in the validation process.

Once all data has been validated by the Field Survey Team Leader, they will then be able to check the box titled “Validated” (see Red box in Figure 6a) and then press submit at the end of the page. This will then enable SPC staff to go ahead and publish the data into PacRIS.

This process will need to be repeated at the end of each day that data is collected especially where there is no access to internet in the field and data is uploaded back in the office.

If Field Teams have access to internet in the field, SPC will also have access to the Kobo server where data is being uploaded to and can also monitor this real time via an extension in Kobo linked to Power BI. From the data collection page in Power BI, the page can be set to be refreshed automatically every few seconds allowing validation in near real time to be done. This allows SPC staff to liaise with Field Survey Team Leader on the ground to correct any major anomaly that has been identified from data uploaded.

← → ↻ 🏠 Not secure | 3.26.115.79/admin/revue/building/97/change/

PCRAFI Revue Tool - Field Data Validation

Home > Revue > Buildings > Tonga Building 97

Start typing to filter...

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Change Building

Tonga Building 97

☐ Validated

☐ Published

Country: Tonga

Location point:

Delete all Features

Figure 6a

← → ↻ 🏠 Not secure | 3.26.115.79/admin/revue/building/97/change/

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Lat:

Lon:

Photo 1: [Clear](#)

Change: [Choose file](#) No file chosen

Photo 2: [Choose file](#) No file chosen

Photo 3: [Choose file](#) No file chosen

Photo 4: [Choose file](#) No file chosen

Usage occupancy class: Commercial

Subuse: None

Foundation type: Concrete Slab

Foundation bracing:

Foundation condition: 3 Fair Condition

Min floor height above ground: <1.0M (25Cm Increment)

Figure 6b

8.0 Flow Diagram of a Summary of the Revue Process

